

A SURVEY OF THE PROSTIGMATIC MITES (ACARINA: TROMBIDIFORMES:  
PROSTIGMATA) ASSOCIATED WITH PLANTS IN SOUTH AFRICA, WITH  
DESCRIPTIONS OF A NEW GENUS AND NEW SPECIES

BY

MAGDALENA K. P. MEYER

(Institute for Zoological Research, Department of Zoology,  
Potchefstroom University for C.H.E., Potchefstroom)

THESIS

PRESENTED FOR THE DEGREE OF

DOCTOR SCIENTIAE

IN THE

POTCHEFSTROOM UNIVERSITY FOR C.H.E.

PROMOTOR: DR. P.A.J. RYKE.

JANUARY, 1959.

A SURVEY OF THE PROSTIGMATIC MITES (ACARINA: TROMBIDIFORMES:  
PROSTIGMATA) ASSOCIATED WITH PLANTS IN SOUTH AFRICA, WITH  
DESCRIPTIONS OF A NEW GENUS AND NEW SPECIES

BY

MAGDALENA K.P. MEYER

(Institute for Zoological Research, Department of Zoology,  
Potchefstroom University for C.H.E., Potchefstroom.)

CONTENTS

I. INTRODUCTION.....	5-7
II. SYSTEMATICS OF THE TROMBIDIFORMES OCCURRING ON S.A. PLANTS.....	8-14
III. DESCRIPTIVE SECTION.....	15-186
Cohors Promatina.....	15
Subcohors Eleutherogona.....	15
Superfamily Tetranychoidae.....	15
Family Tetranychidae.....	16-50
Family Tenuipalpidae.....	51-63
Family Tuckerellidae.....	63-64
Superfamily Raphignathoidea.....	65
Family Caligonellidae.....	65-71
Family Stigmaeidae.....	71-86
Family Raphignathidae.....	86-90
Family Cryptognathidae.....	91-92
Superfamily Cheyletoidea.....	93
Family Cheyletidae.....	93-97
Superfamily Anystoidea.....	98
Family Anystidae.....	98-108
Family Pseudocheylidae.....	108-109

Subcohors Eupodostigmata.....	110
Superfamily Eupodoidea.....	110
Family Eupodidae.....	110-121
Family Rhagidiidae.....	121-123
Superfamily Cunaxoidea.....	124
Family Cunaxidae.....	124-126
Family Bdellidae.....	126-140
Superfamily Tydeoidea.....	140
Family Tydeidae.....	140-148
Subcohors Stomatostigmata.....	149
Superfamily Labidostommoidea.....	149
Family Labidostomidae.....	149-152
Cohors Parasitengina.....	153
Superfamily Erythraeoidea.....	153
Family Erythraeidae.....	153-167
Family Smaridiidae.....	167-171
Superfamily Trombidoidea.....	172
Family Trombidiidae.....	172-186
IV. REFERENCES.....	187-193

ABSTRACT

This taxonomic study comprises a general review of the distribution, classification and external morphology of the parasitic and predacious prostigmatic mites occurring on South African plants. One new genus and 43 new species are described. The new species are: Acheles aethiopica, Allothrombium lawrencei, Anandia bathursti, Balaustium bipilum, B. cristatum, B. graminum, B. medicagoense, B. vignae, Bdella neograndjeani, B. thori, Bechsteinia grahami, Biscirus macfarlanei, Chaussieria capensis, Cryptognathus cucurbita cucurbitella, Cyta phaseoli, Enemothrombium curiosetosum, Erythraeus munsteri, Ettmülleria pretoriae, Eupalopsis brevopilus, Eupodes fusiferellus, E. parafusifer, Fessonnia brevicristata, Labidostomma aethiopica, Ledermülleria lineolata, L. neomaculata, Leptus intermedius, Linopodes motatorius africanus, Mediolata africana, Microtrombidium grahami, M. potchefstroomense, M. spinosum, Neophyllobius cavumarboris, N. natalensis, Oligonychus proteae, Parapetrobia (n.gen.) capensis, Pronematus pruni, Raphignathus bathursti, Smaris biscutatus, Tenuipalpus ovalis, Tydeus eriophyes, T. grabouwi, T. munsteri, Villersia oudemansi.

The following known species are for the first time recorded from South Africa: Aplonobia histricina, Apostigmaeus navicella, Brevipalpus inornatus, Cheletomorpha lepidopterorum, Cheyletia wellsi, Coccorhagidia clavifrons, Cunaxa setirostris, Dolichotetranychus salinas, Eotetranychus perplexus, Eupodes variegatus, Oligonychus bicolor, O. pratensis, Petrobia harti, P. latens, Tetranychus atlanticus, T. desertorum.

Keys to the South African families, genera and species of Prostigmata associated with . . . plants are given. Species previously known to occur in South Africa which are also included in the keys are:

Anystis baccarum, Bdellodes exilicornis, B. hessei,  
Brevipalpus californicus, B. natalensis, Bryobia praetiosa,  
Dolichotetranychus macer, Eupodes longipilus, Eutetranychus  
banksi, Halotydeus destructor, Labidostomma höegi,  
Oligonychus coffeae, O. hadrus, Odontoscirus virgulatus,  
Panonychus citri, Penthaleus major, Tenuipalpus micheli,  
T. podocarpi, T. quadrisetosus, Tetranychus telarius,  
Tuckerella ornata, Tydeus citri.

## I. INTRODUCTION

Most Acarologists consider the Acarina to be either a subclass or an order of the class Arachnida. They are readily separable from other arachnids in that they possess a distinct gnathosoma and the fact that they are never divided so that a distinct cephalothorax and abdomen are clearly recognizable. The suborder Trombidiformes is characterised by the presence of a pair of stigmata on or near the gnathosoma; the palpi are usually free and the chelicerae are either modified for piercing or for seizing prey. The vast majority of the trombidiform mites belong to the Prostigmata. For a general review of the morphology and classification of this group and the Acarina in general the reader is referred to Vitzthum (1929, 1931, 1943), Banks (1915), Berlese (1882-1903), Baker & Wharton (1952). The monumental work of Oudemans (1926-1937), *Kritisch Historisch Overzicht der Acarologie*, is also an invaluable guide to the literature on the mites described prior to 1850. Our present knowledge of the taxonomy of the prostigmatic Acarina is essentially based on the pioneer work of Thor, Oudemans, Grandjean, André and Baker. Notable contributions to our knowledge of the South African members of this group were made by Tucker and Lawrence.

In recent years there has been an increasing awareness of the destructive rôle played by phytophagous mites. Their economic importance, coupled with the difficulties encountered in their control by chemical methods, and the fact that modern spray practices are not conducive to the survival of their natural enemies, is at present also stimulating investigations on the ecology of these Acarina. Because of their small size the identification of the mites requires critical high power examination of the finer morphological characters. As the new acaricides used for mite control are often highly selective in their action, it is necessary to determine the particular species.....

species.....

species with which the economic entomologist is concerned. Different species may predominate as the season advances and often there is a marked change in the prevalence of various species from season to season. Repeated identification of mites is necessary in considering selection of acaricides for their control.

Many important studies were also conducted by research workers to determine the rôle played by predacious mites in restoring the natural equilibrium. It was found that, in many instances, the natural mite enemies exert a very effective control of the phytophagous forms when their activities are not inhibited by detrimental chemical treatments used for the control of other pests. For these reasons I believe that a taxonomic survey of the parasitic and predacious prostigmatic mites occurring on South African plants is appropriate and timely.

The present study is based largely on material collected in different parts of South Africa. Because of their small size these mites are difficult to handle. The majority were collected with the aid of a hand lens and a moistened camel's-hair brush and preserved in small vials containing 70 per cent ethyl alcohol. Where possible plant material ~~were~~ brought into the laboratory and the specimens collected with the aid of a stereoscopic microscope. This is especially advisable in the case of the spider mites in order to ascertain that both sexes are obtained for study. The Berlese funnel was found most efficient for collecting mites associated with grasses. The specimens were either mounted in a polyvinol alcohol preparation (Turttox C.M.C) or in Hoyer's medium as given by Pritchard & Baker (1955) (50 grams distilled water, 30 grams gum arabic, 200 grams chloral hydrate, 20 grams glycerine —  
mixed.....

mixed.....

mixed in this sequence). Temporary preparations were made by placing the mites in lactic acid on a microscope slide; the preparation was then gently heated until clear. Usually they were studied under an ordinary research microscope but in many cases, however, oil-immersion lenses and/ or phase-contrast equipment were necessary for critical examination. For further details of the techniques used the reader is referred to Ryke & Meyer (1958).

I wish to record my gratitude to Dr. P.A.J. Ryke under whose supervision this investigation was carried out. His constant interest and stimulating discussions ~~is~~<sup>are</sup> greatly appreciated. My sincere thanks are due to Prof. G.T.S. Eiselen and Dr. J.A. van Eeden for constructive criticism, encouragement and helpful suggestions. I am indebted to the Council for Scientific and Industrial Research for the financial assistance given to Dr. Ryke to collect the material in various parts of South Africa. I would also like to tender my appreciation for the assistance given by Mr. D. Macfarlane of the Commonwealth Institute of Entomology in the British Museum (Natural History), London. My thanks are also due to Prof. W.N. Coetzee for checking the endings of new specific and subspecific names, and to Miss. R. Strydom and Miss. S.M. Louw for French translations. I am also indebted to my sister, Miss. J.E. Meyer for technical assistance.



II. SYSTEMATICS OF THE TROMBIDIFORMES OCCURRING ON S.A. PLANTS

The order Acarina, comprising both mites and ticks, ~~are~~<sup>is</sup> not a very familiar group to any but the specialist. They are, however, among the most widely distributed animals in the world. It is difficult to give any satisfactory definition of the Acarina and this is due to the great diversity of structure within the order. The Trombidiformes may be readily separated from the other suborders by the characters given in the following key (adapted from Evans (1957)):-

1. More than one pair of idiosomal stigmata present; typical ambulacral claws on pedipalps.....ONYCHOPALPIDA
- .Stigmata absent or, if present, only one pair or many opening on various parts of the body; if more than one pair are present the pedipalps are without ambulacral claws.....2
2. Tarsus of the pedipalp with a forked seta ventrally on its inner basal angle; stigmata, one on each side of the body, situated ventro- or dorso-laterally in the region of coxae II to IV and usually provided with an elongate peritreme; chelicerae usually chelate but may be modified in parasitic species.....MESOSTIGMATA
- .Terminal segment of the pedipalp without a forked seta; stigmata with or without peritremes.....3
3. Hypostome modified into a harpoon-like structure provided with numerous recurved teeth; stigmata, one on each side of the body, situated anterior or posterior to coxae IV; ectoparasites of vertebrates.....IXODIDES
- .Hypostome not modified into a harpoon-like structure; stigmata.....

stigmata.....

stigmata situated on various parts of body or absent; with or without pseudostigmatic organs.....4

4. Tracheal system opening through stigmata or 'pores' on various parts of the body, or absent; chelicerae chelate, rarely modified; pedipalps simple; tibia I and II usually with a long whip-like seta dorsally; subcutaneous sclerotized ridges (apodemes), associated with the coxae of the legs, for attachment of muscles usually well-developed; body weakly or strongly sclerotized.....SARCOPTIFORMES

--.Tracheal system opening by a pair of stigmata situated on or near the gnathosoma, or absent; chelicerae and pedipalps usually strongly modified; tibia I and II usually without long whip-like setae dorsally; body usually poorly sclerotized.....TROMBIDIFORMES

The Trombidiformes are sub-divided into three supercohortes, namely the Tetrapodili, Heterostigmata and Prostigmata. The Tetrapodili contain only one family, the Eriophyidae, consisting of very small, wormlike, plant-feeding mites possessing only two pairs of legs in all the developmental stages as well as the adults.

The Heterostigmata include small plant-feeding mites and parasites of arthropods. It is a homogeneous group consisting of four families of which the Tarsonemidae and Pyemotidae contain phytophagous members. They have minute mouth parts, small palps and needle-like chelicerae. Many species do not possess the full number of legs and sexual dimorphism is marked in this group.

The Prostigmata comprise the bulk of the Trombidiformes and contain a vast assemblage of mites of varying sizes, form and colour. They are usually relatively large soft-bodied mites

but.....

but.....

but may possess plates embedded in the chitin and surrounded by striated integument. The chelicerae are usually large and well-developed for grasping or piercing. Many species are of horticultural importance, being either parasites on the plants or predators of the former group.

The morphological characters used in the following key are illustrated in the diagrammatic sketches of a hypothetical trombidiform female mite (diagrams I-V).

Key to the South African families of the Trombidiformes  
associated with plants

- 1. Body elongate, worm-like annulate; without respiratory system.....Tetrapodili (Eriophyidae)
- . Body of normal shape, not worm-like; with respiratory system.....2
- 2. Chelicerae tiny, stylet-like; palpi minute lying close to rostrum; gnathosoma greatly reduced; tiny mites with or without usual number of legs; stigmata of female behind maxillae; male without stigmata or tracheae...(Heterostigmata).....3
- . Chelicerae relatively long; palpi not minute nor lying close to rostrum; gnathosoma usually conspicuous; large mites with four pairs of legs (except in Tenuipalpidae where one genus has only three pairs of legs); stigmata at base of chelicerae.....(Prostigmata).....4
- 3. Leg IV of female with ambulacra (claws and cup)...Pyemotidae
- . Leg IV without ambulacra, ending in terminal and subterminal whip-like setae.....Tarsonemidae

- 4. With a palpal thumb-claw complex.....5
- . Without a palpal thumb-claw complex.....15
  
- 5. Body setae relatively few, arranged in transverse rows....6
- . Body densely clothed with setae.....13
  
- 6. Chelicerae free, hinged at bases so that they are capable of scissors-like movements in a horizontal direction.....  
.....(Anystoidea).....7
- . Chelicerae fused, with needle-like movable chelae.....8
  
- 7. Palpal thumb weak, not prominent; claws always without tenent setae.....Pseudocheylidae
- . Palpal thumb long, prominent, movable chela distal and hook-like.....Anystidae
  
- 8. Cheliceral bases fused with gnathosoma, without indication of suture; peritreme M-shaped on gnathosoma; well-developed palpi and thumb-claw complex....(Cheyletoidea)...Cheyletidae
- . Cheliceral bases fused with each other but not with gnathosoma, suture present; peritremes usually present on anterior portion of propodosoma..... 9
  
- 9. Chelicerae fused to form extrusible stylophore; movable chelae long, curved whip-like; genital opening transverse...10
- . Chelicerae may be fused but not extrusible; movable chelae short, stylet-like but not whip-like; genital opening longitudinal.....11
  
- 10. Dorsum of hysterosoma with 36 fan-shaped setae; the caudal end with a series of flagelliform  
setae.....

- setae.....
- setae.....Tetranychidae
  
- 11. Peritremes not reaching into chelicerae.....12
  - . Peritremes reaching into chelicerae; palpal thumb-claw complex not strong.....Caligonellidae
  
- 12. Coxae arranged into two distinct groups (I-II and III-IV); female genital and anal openings contiguous.....Stigmaeidae
  - . Coxae contiguous; female genital and anal openings slightly separated.....Raphignathidae
  
- 13. Movable chelae long, straight, extrusible.....  
(Erythraeoidea).....14
  - . Movable chelae short, strong, hinged at base; with numerous setae on tectum when present.....  
(Trombidioidea).....Trombidiidae
  
- 14. Gnathosoma small, capable of being withdrawn into body; propodosoma usually elongate anteriorly...Smaridiidae
  - . Gnathosoma large and cannot be withdrawn in the body; propodosoma not elongate anteriorly...Erythraeidae
  
- 15. Gnathosoma extended into very long, cone-like process...16
  - . Gnathosoma short, not cone-like.....18
  
- 16. Gnathosoma free, not enclosed in sheath; chelicerae attached at base and free to move scissors-like in horizontal direction over gnathosoma....(Cunaxoidea)....17
  - . Gnathosoma.....

- . Gnathosoma.....
- . Gnathosoma enclosed in sheath formed by extension of the body wall; no suture between propodosoma and hysterosoma; chelicerae elongated with small, equal, distal shears; with two pairs of genital suckers.....Cryptognathidae
  
- 17. With two pairs of genital suckers; palpi long, turned inward, palpal tarsus usually claw-like, adapted for grasping.....Cunaxidae
  
- . With three pairs of genital suckers; palpi long, elbowed and with long distal setae.....Bdellidae
  
- 18. Movable chela adapted for piercing.....19
  
- . Movable chela usually with teeth; opposed to fixed chela and adapted for biting and grasping.....20
  
- 19. Movable chela small and sharp; not opposed to fixed chela; legs without net-like armor; without genital suckers.....Tydeidae
  
- . Movable chela long, whip-like; with stylophore; small mites related to the Tetranychidae but without thumb-claw complex.....Tenuipalpidae
  
- 20. With "Rhagidia organ" on tarsus I; coxae I-II and III-IV in two separate groups.....21
  
- . Without "Rhagidia organ" on tarsus I; coxae plate-like, contiguous; provided with lens-like eyes and usually with large, lens-like organs behind eyes; palpal tarsus small, pointed with long setae.....(Labidostommoidea.....  
Labidostomidae
  
- 21. With.....

21. With.....

21. With small and sometimes distorted cheliceral shears;  
soft-bodied, without projection over gnathosoma.....

Eupodidae

--. With large cheliceral shears, body soft; palpal tarsus  
large and rounded with many short setae.....Rhagidiidae

### III. DESCRIPTIVE SECTION

#### COHORS PROMATINA CUNLIFFE, 1955

The following characteristics are distinctive for this group: The tracheal system is distinct; the peritremes may be present or absent; the setation of the body indicates body segmentation, but the actual segmentation is not discernible; the propodosoma may have sensory setae or pseudostigmatic organs; the usually well-developed bodies are often provided with sclerotised areas or plates.

#### SUBCOHORS ELEUTHEROGONA OUDEMANS, 1909

This subcohors contains those families which are provided with an external peritreme together with internal tracheae, and a palpal thumb-claw complex.

#### SUPERFAMILY TETRANYCHOIDEA REKK, 1952

The mites belonging to this superfamily can readily be distinguished from other prostigmatic mites in having the following characteristics: The movable part of each chela is long, whiplike, strongly recurved proximally and set in the fused cheliceral bases (the stylophores); the tarsal claws and empodia are usually provided with tenent setae; all the members are strictly phytophagous. It was only recently that certain non-phytophagous genera, which were included in the tetranychoid families, were removed to other prostigmatic families. The last of these genera was Neophyllobius Berl. which McGregor (1950a) referred to the family Raphignathidae. The superfamily Tetranychoidea comprises the families Tetranychidae Donnadieu, 1875, Tenuipalpidae Berlese 1913, Tuckerellidae Baker and Pritchard 1953 and Linotetranidae Baker and Pritchard, 1953.



FAMILY TETRANYCHIDAE DONNADIEU, 1875

The mites belonging to this family constitute one of the most important economic problems with which the gardener, horticulturalist and fruitgrower have to contend. In certain areas some of these species are serious pests. They are popularly known as "red spiders", "fruit tree mites", "spinning mites" or "spider mites".

The family Tetranychidae is characterised by the presence of duplex setae (and not sensory pegs) on tarsi I and II; the chelicerae are needle-like and covered at their bases by a mandibular plate; the fourth palpal segment is provided with a strong "claw"; the dorsum bears a maximum of 16 pairs of setae; the collar tracheae are situated beneath the mandibular plate. The tarsal appendages are provided with peculiar tenent setae. The main characters used for identification of Tetranychidae are the claw-complex and aedeagus or penis of the male.

Key to the South African genera and species of the family

Tetranychidae

1. Empodium without tenent setae....(Subfamily Tetranychinae)..2
- Empodium with tenent setae..(Subfamily Bryobinae).....6
2. Dorsally, tarsus I with two pairs of duplex setae, the proximal member of each pair being shorter than the distal member; empodium well-developed...(Tribe Tetranychini)....3
- Dorsally, tarsus I with at most a single pair of usually loosely associated duplex setae, the proximal member usually as long as or longer than the distal member, or else the duplex setae are absent; empodium very small or absent.....

absent.....

absent..... Tribe Eurytetranychini

Empodium rudimentary and rounded, appearing

absent.....Eutetranychus Banks

- a. Body with dorsal setae not set on tubercles;  
dorso-central setae conspicuously shorter than  
the dorsolateral hysterosomals...E. banksi  
(McGregor)

3. Empodium clawlike with paired proximo-ventral setae...4

---. Empodium not clawlike but composed of two to three pairs  
of proximo-ventral setae.....5

4. Opisthosoma with two pairs of para-anal setae; dorsal  
body setae arise from strong tubercles...Panonychus  
Yokoyama:

- a. The outer sacral setae are equal in length to the  
clunal setae.....P. citri (McGregor)

---. Opisthosoma with one pair of para-anal setae; dorsal body  
setae not arising from tubercles.....Oligonychus Berl.

- a. Tibia I with seven tactile setae; tarsus I with a  
single seta on venter beyond first duplex setae;  
the male with aedeagus bent downwards.....b

---. Tibia I with eight or nine tactile setae; tarsus  
I usually with two tactile setae on venter beyond  
first duplex setae; the male with the aedeagus  
bent upwards.....d

b. Tarsus I with three tactile setae proximal to  
duplex setae.....c

---. Tarsus I with four tactile setae proximal to  
duplex.....

duplex.....

duplex setae. The distances between the two tactile setae and the sensory seta on the dorsal side of the tibia are much smaller than in other members of the Ununguis subgroup.....O. proteae, n.sp.

c. Aedeagus gradually narrowing distally. The bent portion of aedeagus with tip directed ventrad .....O. coffeae (Nietner)

--. Aedeagus with distal end abruptly narrowed. The bent portion forms an obtuse angle with shaft.....O. bicolor (Banks)

d. Hysterosoma with integumentary striations longitudinal caudad of inner sacral. Knob of aedeagus about twice as wide as stem of the knob.....O. pratensis (Banks)

--. Hysterosoma with integumentary striations transverse between the inner and outer sacral setae. The aedeagus with the distal enlargement strongly convex on the dorsal margin and the acuminate tip caudo-ventrally directed, reaching the level of the axis of the shaft...O. hadrus  
Pritchard & Baker

5. Opisthosoma with two pairs of para-anal setae; duplex setae situated near each other and placed near the distal end of tarsus I.....Eotetranychus Oudemans

a. The female may be recognised by the four tactile setae on tarsus I proximal to the duplex setae and the fact that the dorsal setae are longer than the distances between their bases. The  
aedeagus.....

aedeagus.....

aedeagus is distinctive in being enlarged at the distal end and terminally forms a knob which has a dorsal projection and a curved ventrad projection.....E. perplexus (McGregor)

--. Opisthosoma with a single pair of para-anal setae; tarsus I with the duplex setae widely spaced on the dorsum...Tetranychus Dufour

a. The duplex setae on tarsus I in a line with most of the proximal setae; distal knob of aedeagus of male with anterior and posterior projections, the latter of which curves sharply downwards like the claw of a hammer.....T. desertorum Banks

--. Tarsus I with a proximal pair of duplex setae situated distally to the proximal tactile setae; posterior projection of knob of aedeagus not like the claw of a hammer.....b

b. Knob of the aedeagus always small, about one-sixth the length of margin of shaft...T. telarius (Linn.)

--. Knob of aedeagus moderately enlarged, about one-fourth the length of the dorsal margin of the shaft.....T. atlanticus McGregor

6. Propodosoma with four pairs of dorsal setae; true claw uncinata and with one or several pairs of medio-lateral tenent setae.....Bryobia Koch

a. With strong anterior propodosomal projections; empodium of leg I in the adult female consisting of a single pair of tenent setae; dorsal setae leaflike.....B. praetiosa Koch

- . Propodosoma with three pairs of dorsal setae; hysterosoma with ten pairs of hysterosomal setae of which three pairs are dorso-laterals; true claw a short, slender pad with a pair of tenent setae.....7
  
- 7. Empodium padlike or consisting of a pair of tenent setae.....Aplonobia Womersley
  - a. Empodial pad twice as long as pad of the true claw; the stout dorsal setae, which are set on tubercles, are as long as the distances between their bases.....A. histricina (Berl.)
  
- . Empodium not padlike but clawlike or uncinata.....8
  
- 8. Empodium clawlike and with two rows (each consisting of about 10-15 setae) of ventrally-directed tenent setae; tarsus I with two sets of duplex setae.....Petrobia Murray
  - a. Dorsal setae set on tubercles and longer than the distances between the bases of consecutive setae.....P. harti (Ewing)
  
  - . Dorsal setae not on tubercles and shorter than the distances between their bases....P. latens (Müller)
  
- . Empodium uncinata and with two rows (each consisting of about five to eight setae) of dorsally-directed tenent setae; tarsus I with four sets of duplex setae...Parapetrobia, n.gen.
  - a. The stout dorsal setae, arising from strong tubercles, are much longer than the distances between the bases of consecutive setae.....P. capensis, n.sp.

SUBFAMILY TETRANYCHINAE BERL., 1913

The females of the Tetranychinae possess two pairs of anal setae and the males have four pairs of genito-anal setae. The true claw is reduced to a small pad, bearing a pair of long tenent setae and the empodium is devoid of any tenent setae. The dorsal surface of the body is provided with three pairs of propodosomal and ten pairs of hysterosomal setae. The dorso-sublaterals are absent in the latter series.

TRIBE TETRANYCHINI REKK, 1913

The majority of the genera in the family Tetranychidae are members of the tribe Tetranychinae. This tribe also includes most of the economically important species. They can readily be distinguished from the other tetranychids by the well-developed empodium usually represented by several pairs of ventrally-directed proximo-ventral setae and a dorso-median clawlike appendage. The dorsal surface of tarsus I is usually provided with two pairs of duplex setae whereas tarsus II bears one pair of duplex setae only. The proximal seta of the duplexes is relatively well-developed and crosses the much longer distal member. Because of the diagnostic value of the aedeagus of the male both sexes are often necessary to determine the particular species. The males must be mounted laterally to see the outline of this structure. The females should be mounted dorsal side upwards.

Genus TETRANYCHUS Dufour, 1832

The synonyms of the genus Tetranychus are given by Pritchard and Baker (1955). Mites belonging to this genus are found on the under side of the leaves of a multitude of host plants where they usually form colonies. The different

species.....

species.....

species are often very similar in appearance and can only be identified under the high power of a research microscope.

Ewing (1913) found that the genital armatures of the males are excellently adapted for taxonomic purposes. This also proved to be an important structure for the identification of species in other tetranychid genera.

The aedeagus in this genus is bent sharply dorsad, and the shape of its distal end is an important diagnostic characteristic for the identification of the species. They are further characterised by the presence of a pair of para-anal setae and the absence of the postanals; the empodium is split into two or three pairs of proximoventral setae or appendages and, in the male, it may bear a small spur; the peritreme is simple with a long four or five chambered loop, rarely anastomosing; the duplex setae on tarsus I are well separated in all the species.

#### Telarius Group Pritchard & Baker

Members of this group may be recognised by the presence of a tiny mediodorsal spur on the empodium or the entire absence of the spur; the proximal pair of duplex setae on tarsus I are distal to the four tactile setae at the base of the segment; the transverse striations between the third pair of dorsocentral hysterosomals and the inner sacrals in the female are in the form of a diamond-shaped figure.

#### Tetranychus telarius(Linn.), 1758

(Figs. A 1-8)

As Tetranychus telarius has two basic colour varieties namely the greenish, two-spotted form and the carmine form, it led to much confusion as to the correct nomenclature of this species. Tetranychus bimaculatus Harvey, 1898 was the name.....

name.....

name commonly used in South Africa for this mite. Recently Pritchard & Baker (1955) dealt with a large number of synonyms for this species and they pointed out that T. bimaculatus as well as T. multisetis McGregor, 1950 are synonyms of T. telarius.

Female (fig. 1)

Dimensions: Length of body (excluding gnathosoma) 482  $\mu$ ; breadth of body 360  $\mu$ .

The females exhibit variations in colour which depend on the food plants and seasons. Actively feeding females are greenish to brick-red in colour with a prominent dark spot on each side of the body; as the mite feeds the spots may enlarge to cover the greater part of each side of the oval-shaped body.

Dorsum. The integumentary transverse striations between the third pair of dorso-centrals and the inner sacral setae form a diamond-shaped figure. The striations behind and laterally of the diamond-shaped figure are mostly longitudinal. The dorsum is provided with 13 pairs of linear-lanceolate, finely setose setae. One perfect and one imperfect eye cornea are present on each side.

Gnathosoma. The mandibular plate is rounded anteriorly and not distinctly notched. The terminal segment (thumb) of the palpus (fig. 6) which is about as long as it is broad, bears a terminal sensilla. On its dorsal surface it bears another sensilla which is spindle-shaped and slightly shorter than the terminal one. The usual five setae are present on the thumb.

Legs. The legs are shorter than the length of the body. Tarsus I (fig. 3) is provided dorsally with two pairs of well separated duplex setae, the proximal pair of which are

distad.....



distad.....

distad of the four proximal tactile setae. The empodium (fig. 4) consists of six empodial setae, the proximal pair being the strongest. The mediodorsal spur of the empodium is tiny or absent.

Male (fig. 2)

Dimensions: Length of body 312  $\mu$ ; breadth 203  $\mu$ .

The body is smaller and narrower than in the female. The four legs are slightly shorter than the body (excluding the gnathosoma). The palpus (fig. 7) is provided with a spur on the second segment. The empodium of leg I is stout and bears a straightish narrow spur situated medio-dorsally. The empodium (fig. 5) consists of six short empodial digits.

The aedeagus (fig. 8) has a rodlike inner lobe which is longer than the thick shaft; it bends upwards and forms an angle of approximately  $90^{\circ}$ . The small basilar lobe on the upper side of the shaft projects slightly backwards. The knob is always small with an anterior and a posterior projection.

Hosts and distribution. This cosmopolitan species occurs in most parts of South Africa. It attacks nearly every plant and is a serious pest of fruit trees and other plants in certain parts of the country. The following is a list of plants on which this mites are known to occur: Phaseolus vulgaris, Zea mais, Solanum tuberosum, Primula sp., Prunus persica, Stercula murex, Gossypium, Digetaria diversinervis, Citrus limonia, Citrus sinensis, Poincettia pulcherrima, Physalis peruviana, Musa sapientum, Pirus malus, Ficus carica, Digitalis purpurea, Rosa sp., Prunus domestica, Pirus communis, Dahlia sp., Dianthus caryophyllus, Vitis sp., Pharbitis hispida, Prunus amygdalis, Medicago sativa, Morus sp., Sorghum saccharatum, Eriobotrya japonica, Pelargonium sp., Hibiscus rosa sinensis, Populus caneocens,

Psidium.....

Psidium.....

Psidium guayava, Lupinus sp., Tropaeolum, Helianthus annuus,  
Ricinus communis, Xanthium pugnans., many species of weeds.

Discussion. According to Pritchard & Baker (1955) it is possible that T. telarius represents a polytypic species which consists of a number of subspecies. Collections from different parts of South Africa revealed the presence of two colour varieties namely the carmine and the greenish forms. Other intra-specific variations which were observed are the following: The degree of development of the anterior and posterior projections of the knob of the aedeagus; in some specimens the projections are more conspicuous than in others, in some cases the proximal pair of duplex setae on tarsus I are situated posterior to their usual position. These variations, however, do not even merit the creation of new subspecies.

Tetranychus atlanticus McGregor, 1941

(Figs. A 9-14)

Female

Dimensions: Length of body (excluding gnathosoma)  
445  $\mu$ ; breadth of body 345  $\mu$ .

No characters of taxonomic value have been found to separate the females of T. atlanticus and T. telarius. In both species the integumentary striations form a diamond-shaped figure between the inner lumbar (3rd pair of dorso-central setae) and inner sacral setae. The appearance of the active females of T. atlanticus is very similar to the greenish form of T. telarius.

Male

Dimensions: Length of body 320  $\mu$ ; breadth of body 159  $\mu$ .

The.....

The.....

The body is shorter and narrower than that of the female. The aedeagus (fig.14) has the inner lobe rodlike; the shaft is thick and stout. The latter is broader at its base than at its distal end where it bears the prominent hook. A small reduced basilar lobe is present on the upper side of the shaft. The knob is present at the distal end of the shaft and is about one-third to one-fourth the length of the dorsal margin of the shaft. The anterior projection is shorter and rounder than the posterior one which is small and acute. Judging from the figure given by Pritchard & Baker (1955) the anterior projection of the South African specimens appears smaller than that of the American forms. The shaft also appears somewhat broader. It is, however, very probable that the American and South African species are conspecific.

Hosts and distribution. T. atlanticus has been recorded from the United States, Turkey and Japan. The species is usually found on low-growing plants. Specimens of this species were collected from unidentified hedge plants in Tamboerskloof, Cape Town.

Desertorum Group Pritchard & Baker

The mites of this group are recognised by the proximal pair of duplex setae which are in a line with the four tactile setae on tarsus I; the longitudinal striations on the dorsum of the female form a broad triangle between the inner lumbar and the inner sacral setae. The specific identity of the females belonging to this group cannot be ascertained before observation of their males.

Tetranychus desertorum Banks, 1900.

(Figs. A 15-20)

According to Pritchard & Baker (1955) this species is synonymous with certain species which McGregor referred to

the.....

the.....

the genus Septanychus. These authors consider this genus to be a synonym of Tetranychus.

Female (fig 15)

Dimensions: Length of body 500  $\mu$ ; breadth of body 400  $\mu$ .

In dorsal view the outline of the body is ovate.

Dorsum. The striations resemble those of Tetranychus telarius. The 26 dorsal body setae are linear-lanceolate, finely setose and not set on tubercles. One perfect and one imperfect eye cornea is present on each side of the body.

Gnathosoma. The mandibular plate is rounded anteriorly. The collar tracheae are U-shaped, the outer arm being longer than the inner one. The last segment (thumb) of the palpus (fig. 16) is slightly longer than broad and bears a terminal sensilla, which is nearly twice as long as it is thick, a dorsal sensilla, which is ovate-clavate, and the usual five setae.

Legs. Tarsus I (fig.17) is dorsally provided with two sets of duplex setae, the proximal pair of duplex setae being in a line with the majority of other proximal setae. The empodium, which consists of six empodial setae, bears a spur mediodorsally. A pair of tenent setae arise from a pad which is situated on each side of the empodium.

Male.

Dimensions: Length 381  $\mu$ , breadth 210  $\mu$ .

The body is smaller and narrower than the female. The second segment of the palpus bears a hornlike spur, dorsally. The aedeagus (fig. 20) has a long rodlike inner lobe and an inconspicuous basilar lobe. The distal half of the shaft rapidly tapers posteriorly to the point of origin of the hook and bends upward to form an angle of about  $90^{\circ}$ .

Anteriorly.....

Anteriorly.....

Anteriorly the knob is provided with a small acute projection and posteriorly with a slightly larger curved acute projection.

Hosts and distribution. T. desertorum has a wide distribution in South Africa and occurs on a great variety of host plants. The following is a list of host plants on which this mite has been found in the Western Province and the Transvaal:

Physalis peruviana, Bidens pilosa, Phaseolus vulgaris,  
Pharbitis hispida, Dryopteris sp., Rubus pinnatus, Fragaria carica,  
Zantedeschia aethiopica, Physalis sp., Dahlia sp.,  
Pirus malus, Zinnia, Hydrangea hortensia, Pelargonium sp.,  
Vitus sp., Prunus persica, Althaea rosea, Helianthus annuus.

#### Genus OLIGONYCHUS Berl., 1886

Pritchard & Baker (1955) regard Paratetranychus Zacher as a synonym of Oligonychus. This genus can be identified by the presence of a clawlike empodium which have six to twelve setae proximoventrally. The peritreme is usually straight and terminates in a simple bulb. The caudal pair of para-anal setae are absent.

Pritchard & Baker (1955) use the number of tactile setae on tibia and tarsus I, as well as the aedeagus, as taxonomic features to divide this genus into groups and subgroups.

#### Ununguis Group Pritchard & Baker

Mites of this group are characterised by the presence of six or seven tactile setae on tibia I and one to four setae proximal to the duplex setae on tarsus I. The empodium consists of four to six proximoventral setae, with the exception of tarsus I of the male which is often provided with three. The aedeagus of the male bends ventrally. There are transverse striations throughout the dorsocentral area of the hysterosoma.

Oligonychus bicolor (Banks), 1894

(Figs. A 21-28)

Female (fig. 21)

Dimensions: Length of body 346  $\mu$ ; breadth of body 238  $\mu$ . The general appearance of the female is similar to that of the females of Oligonychus coffeae, O. newcomeri and O. viridis. The colour is dark red. The body outline is oval-shaped.

Dorsum. There are 26 well-developed, linear-lanceolate, distinctly setose setae (fig. 22) present on the dorsum. The striations are mostly transverse. In some specimens these striations are indistinct. One perfect and one imperfect eye cornea are present on each side of the propodosoma.

Gnathosoma. The mandibular plate (fig. 23) is notched in front. In specimens taken from the peach, the mandibular plate is not so deeply notched as it is in the specimens from the oak. Each of the collar tracheae (fig. 24) consists of a short, straightish tube which terminates internally in a swollen oval chamber. The "thumb" of the palpus (fig. 25) is broader than long and bears the terminal sensilla, which is nearly as thick as long, the dorsal sensilla, which is very small, and five additional setae.

Legs. Tarsus I (fig. 26) is dorsally provided with two sets of duplex setae; four setae (three of which are tactile) are borne proximal to the proximal set of duplex setae. Tibia I (fig. 26) bears eight setae of which seven are tactile. The empodium is clawlike and provided with six proximoventral setae. The usual four tenent setae are present.

Male

Dimensions: Length 291  $\mu$ ; breadth 175  $\mu$ . The male is smaller than the female. The second segment of the palpus (fig. 27) is provided with a hornlike spur; the  
terminal.....

terminal.....

terminal sensilla of the thumb is much smaller than that of the female. The claws are similar to those of the female. The inner lobe of the aedeagus (fig. 28) expands dorsally to reach the basilar lobe which is rather inconspicuous. The stout, tapering shaft is deflected posteriorly to form an angle of about  $90^{\circ}$ . The hook which tapers evenly to a tip is devoid of a knob.

Hosts and distribution. In the Western Province and the Transvaal specimens were found on the following host plants: Quercus sp., Senecio angulatus, Prunus persica, Trichelia dregeana, Vitis sp., Plumeria, Hakea sp., Pyracanta sp.

Oligonychus coffeae (Nietner), 1861

The female of this species is similar in appearance to the females of Oligonychus bicolor, O. viridis, and O. newcomersi. It bears seven tactile setae and one sensory seta on tibia I; three tactile setae and one sensory seta are situated proximal to the duplex setae on tarsus I. O. coffeae can be distinguished from the above-mentioned three species in the shape of the aedeagus; its distal bend is at a right angle to the shaft and it gradually tapers to a slender terminal truncated tip.

This species was described by Tucker (1926) under the name Oligonychus merwei, collected from tea plants, Stanger, Natal. Pritchard & Baker (1955) consider it to be conspecific with O. coffeae.

Oligonychus proteae, n.sp.

(Figs. A 29-33)

Only the female of this species was found.

Female (fig. 29)

Dimensions: Length of body 400  $\mu$ ; breadth of body 320  $\mu$ ; length of leg I 300  $\mu$ , leg II 200  $\mu$ , leg III 170  $\mu$ , leg IV 170  $\mu$ .

The colour in the living form is red as in other members of the Ununguis subgroup. The general appearance of the female is similar to that of O. yothersi, O. punicae, O. peronis, O. ununguis, O. coniferarum, and O. mangiferus. It can however readily be distinguished by the relative positions of the two tactile setae and the sensory seta on the dorsal side of tibia I. The distances between these setae are much smaller than in the other species.

Dorsum. The thirteen pairs of dorsal body setae, including the caudal pair, are well-developed, linear-lanceolate, finely setose and not set on tubercles. The striations of the hysterosoma are mainly transverse. One perfect and one imperfect eye cornea is present on each side.

Gnathosoma. The mandibular plate is not clearly emarginate in front. The peritreme is straight distally and scarcely enlarged at the tip. The last segment of the palpus (fig. 30) is distinctly broader than long; the terminal sensilla is about as broad as it is long.

Legs. As in other members of the Ununguis subgroup it is characterised by eight setae (seven of which are tactile) on tibia I (fig. 31) and four tactile setae proximal to the duplex setae on tarsus I (fig. 31). Tibia II (fig. 32) is provided with five tactile setae. The empodial claw is slightly longer than the five proximoventral setae.

Larva (fig. 38). The three-legged larva exhibits the same characteristics as the female.



Host and locality. One holotype female and one larva from the flower of Protea incompta, Humansdorp, April 1955. Flowers collected and sent to author by Prof. H.B.Rycroft, Kirstenbosch.

Pratensis Group Pritchard & Baker

The Pratensis group may be recognised by the proximo-ventral appendages of empodium I of the male which consist of a single pair of spurs; the aedeagus bends dorsad and is moderately enlarged at its distal end. The females of the different species are similar in appearance and, as a group, they exhibit the following characters: Tibia I bears nine tactile setae; tarsus I has four tactile setae proximal of the proximal set of duplex setae; the dorsal striations are transverse dorso-laterally as well as between the dorsocentral hysterosomals and longitudinal between the sacrals.

Oligonychus pratensis (Banks), 1912

(Figs. A 34-38)

Female (fig. 34)

Dimensions: Length of body 470  $\mu$ ; breadth of body 356  $\mu$ . The females of this species resemble those of the other members of the Pratensis group.

Dorsum. The striations on the hysterosoma of this oval-shaped mite are mainly transverse. The eyes are normal for the Tetranychidae. The 26 dorsal body setae are linear-lanceolate and not set on tubercles.

Gnathosoma. The mandibular plate being rounded in front is devoid of an emargination. The "thumb" of the palpus (fig. 35) is slightly broader than long, bearing a terminal sensilla which is twice as long as broad; two pin-shaped setae are present on the dorsal surface of the thumb apex; the dorsal  
sensilla.....

sensilla.....

sensilla is situated at the middle of the thumb and is slightly longer than the terminal sensilla; the thumb is provided with the usual three additional setae.

Legs. The legs are shorter than the body. Tarsus I (fig.37) bears two sets of duplex setae which are well separated; four setae (three of which are tactile ) are borne proximad of the proximal set of duplex setae. Tibia I bears nine tactile setae. The ventral aspect of the well-developed empodial claw is provided with six deflexed setae.

#### Male

Dimensions: Length 231  $\mu$ ; breadth 170  $\mu$ . The body is smaller and narrower than in the female. A palpal spur and supporting tubercle are present. The aedeagus (fig. 38) is of the type of Tetranychus telarius; the inner lobe is rodlike; the shaft is stout and about twice as long as its basal thickness; it gradually tapers backward and bends upward with an angle beyond 90°; the hook forms a terminal knob which is twice as wide as the stem of the knob; the knob bears a blunt anterior and a sharp posterior projection, the latter being somewhat upturned.

Host and distribution. Specimens were found in the Eastern Transvaal and Orange Free State on the following host plant: Digitaria diversinervis.

Oligonychus hadrus Pritchard & Baker, 1955

This species closely resembles Oligonychus pritchardi and O. propetes. It, however, differs from them in the fact that both sets of duplex setae on tarsus II are composed of members which are more or less equal in length, rather than having the proximal member of each duplex pair very short. The terminal sensilla on the palpus of the female is very slender and more than four times as long as broad.

The aedeagus is very similar to that of Oligonychus propetes. The postero-ventral portion curves dorsad; the large distal enlargement is dorsally strongly convex and bears a small anterior angulation and a large caudo-ventrally curved projection.

Host and locality. This species was described by Pritchard & Baker (1955). They were found on Gombretum zeyheri in Pretoria.

Genus EOTETRANYCHUS Oudemans, 1931

Pritchard & Baker (1955) retained the genus Eotetranychus and considered Apotetranychus and Platytetranychus as synonyms of the former. Members of this genus can be identified by the presence of the caudal pair of para-anals and by the

empodium.....

empodium.....

empodium (as in Tetranychus) which consists of three pairs of setae (fused in leg I of the male ). Like the genus Tetranychus the members of this genus are also found on the under sides of the leaves where they form small colonies. In addition to the two pairs of para-anals the duplex setae on tarsus I are adjacent to each other. The striations on the dorsum usually run transversely between the third pair of dorso-central hysterosomals and the sacrals.

The integumental striations on the genital flap and the number of tactile setae on tibiae I, II, and III are important characters for species recognition.

Tiliarum Group Pritchard & Baker

The mites of this group can be identified by the presence of eight tactile setae on tibia II. For species separation a lateral view of the aedeagus is necessary.

Eotetranychus perplexus (McGregor), 1950

(Figs. A 39-44)

Female (fig. 39)

Dimensions: Length of body 409 $\mu$ ; breadth of body 289 $\mu$ .  
The colour is light green.

Dorsum. The hysterosoma has transverse striations in the region of the lumbar and sacral setae. The 26 dorsal body setae are strongly developed, linear-lanceolate, distinctly setose and not set on tubercles. The eyes are normal.

Gnathosoma. The mandibular plate is rounded in front. The main arm of the collar trachea is about twice the length of the deflexed arm. The terminal segment of the palpus (fig. 40) is  
about.....

about.....

about as long as it is broad; the terminal sensilla is about twice as long as broad; the dorsal sensilla and five additional setae are carried on the "thumb".

Legs. The legs are shorter than the body. Dorso-terminally, tarsus I (fig. 41) has two sets of duplex setae which are adjacent; four setae are borne proximad of the proximal set of duplex setae. The empodium consists of only three pairs of setae; the usual four tenent setae are present.

#### Male

The male is smaller than the female. The legs are relatively longer than those of the female; tarsi I and II and tibia I (fig. 43) each have two or three very slightly swollen setae. The terminal sensilla of the palpus (fig. 42) is reduced to a small papilla; the dorsal sensilla is normal; the second segment of the palpus bears a hornlike spur. The thick shaft of the aedeagus (fig. 44) is much stouter at its base than at its distal end. The knob is inconspicuous, acutely pointed dorsally and provided with a curved ventral projection.

Hosts and distribution. Specimens were found on the following plants which were collected in Transvaal, Natal, and the Western Province: Musa sapientum, Salix babilonica, unidentified ornamental shrubs.

Genus PANONYCHUS Yokoyama, 1929

Panonychus is similar to Oligonychus in having six setae borne at a common point on the ventral face of the main tarsal claw. McGregor (1950b) regarded Metatetranychus as a synonym of Paratetranychus (= Oligonychus) but Pritchard & Baker (1955) retained the genus Metatetranychus and considered the

genus.....

genus.....

genus Panonychus to be a synonym of Oligonychus. Yokoyama who created the genus Panonychus only gave a description of P. mori, without the diagnosis of the genus. Ehara (1956) pointed out that P. mori is synonymous with Metatetranychus citri and that Panonychus has priority over Metatetranychus.

The mites belonging to this genus are characterised by the following: The dorsal setae are borne on tubercles; the empodial claw bears three pairs of proximoventral setae of equal length; two pairs of para-anal setae are present, the caudal pair of which are widely spaced; the latter pair are similar to the anterior pair and are situated posterior to the anus.

Panonychus citri (McGregor), 1916  
(Citrus red mite) (Figs. A 45-50)

Originally described as Tetranychus citri. Recently Ehara (1956) considered Metatetranychus as synonymous with Panonychus and formed the new combination P. citri.

Female (fig. 45)

Dimensions: Length of body 427  $\mu$ ; breadth of body 352  $\mu$ . The colour is velvety-reddish. The body is oval-shaped.

Dorsum. The 26 dorsal body setae (fig. 46) are linear-lanceolate, long, distinctly setose and are set on prominent tubercles; these setae are more or less arranged in four longitudinal rows. The second pair of dorsal propodosomal setae are three times longer than the first pair. The striations of the hysterosoma are mostly transverse. The eyes are typical of the tetranychids.

Gnathosoma. The mandibular plate is anteriorly provided with an inconspicuous emargination. The last segment of the palpus.....

palpus.....

palpus (fig. 47) is slightly broader than long; the terminal sensilla is longer than broad; the dorsal sensilla is short; the "thumb" is provided with the usual five additional setae.

Legs. The legs are shorter than the body. The duplex setae of tarsus I (fig. 48) are adjacent and placed near the distal end of the segment; four setae are borne proximad of the proximal set of duplex setae. The empodial claw has three pairs of proximoventral setae. There are two tenent setae present on each side of the claw.

Male (fig. 49)

Dimensions: Length 310  $\mu$ ; breadth 185  $\mu$ . The body is much smaller than that of the female. The legs are relatively longer than in the female. The palpus is provided with a hornlike spur on the second segment. The terminal sensilla of the last segment is approximately of the same length as the dorsal one. The aedeagus (fig. 50) has a short stout shaft which bends upward to form a slender tapering S-shaped curve.

Hosts and distribution: Hosts are primarily broadleaved ever-green trees and shrubs. It is of economic importance because it sometimes occurs very abundantly on citrus and ornamental shrubs. Host plants from which these mites were collected in the Transvaal are the following: Citrus sp.  
Prunus persica .

TRIBE EURYTETRANYCHINI REKK, 1950

The members of this tribe can readily be recognised by the absence of duplex setae on tarsi I and II. The presence of these setae is characteristic of all the tribes in the family Tetranychidae. Tarsi I and II, however, may bear a single pair of dorsally-situated setae, which appears to be homologous.....

homologous.....

homologous with the duplex setae, but the proximal member of the pair is more strongly developed than the distal one. A pair of setae which resemble the second pair of duplexes are situated latero-ventrally on tarsus I. Ten pairs of dorsal hysterosomals and two pairs of para-anals are present on the striated dorsum. The peritreme ends in a simple bulb or hook.

Genus EUTETRANYCHUS Banks, 1917

Pritchard & Baker (1955) regard Anychus as a synonym of Eutetranychus. This genus is distinctive in that the rudimentary empodium is only represented by a rounded knob.. A pair of setae which are probably homologous with one pair of the duplex setae are situated on the dorsum of tarsus I.

Eutetranychus banksi (McGregor), 1914

Studies by Pritchard & Baker (1955) indicated that E. banksi is a polytypic species and that there are several different morphological variants as far as the development of the dorsal body setae are concerned. According to them the description of Anychus africanus given by Tucker (1926) indicate that these specimens resemble those identified by Sayed (1946) as A. orientalis Zacher in which the dorso-central hysterosomal setae are shorter and more spatulate than usual. They regard both africanus and orientalis as synonyms of Eutetranychus banksi.

This species can be readily recognised by the dorsal setae which are not set on tubercles; the dorso-central hysterosomal setae are conspicuously shorter than the dorso-lateral hysterosomals. All the dorsal setae are short and spatulate. The simple aedeagus abruptly turns dorsad near the distal end. Pritchard & Baker (1955) observed no differences between the aedeagi of the males associated with the females representing the various lengths of dorsal setae.

Eutetranychus.....



Eutetranychus.....

Eutetranychus banksi was collected from oranges, lemons and Plumeria sp. (Frangipani) in Durban, Natal.

SUBFAMILY BRYOBINAE BERL., 1913

This subfamily contains the most generalized members of the family Tetranychidae. In the genera Bryobia and Tetranychopsis the true claws are well developed. In the other genera they are reduced to a small slender pad bearing a pair of distal tenent setae. The peritremes end in a glomerate, elongate or saccular termination. The duplex setae are always placed at the abruptly declivate end of the tarsus. Some of the species possess four pairs of dorsal propodosomal setae while others have three pairs. The hysterosoma bears ten or twelve pairs of dorsal setae. Three pairs of anal setae are present in the female and five pairs of genito-anal setae in the male.

TRIBE BRYOBIINI REKK, 1952

The members of this tribe can be readily distinguished by the presence of four pairs of dorsal propodosomals and twelve pairs of hysterosomal setae. The true claw is developed into a curved hook or a long pad which is provided with lateral tenent setae.

Genus BRYOBIA Koch, 1836

Pritchard & Baker (1955) regard Pseudobryobia as a synonym of Bryobia. Mites belonging to this genus may be recognised in having the true claw uncinata with one or several pairs of mediolateral tenent setae. Anteriorly the propodosoma is provided with two pairs of setae which usually arise from strong projections.

Bryobia praetiosa Koch, 1836

(Figs. A 51-66)

A large number of synonyms exist for this species. In South Africa the name Bryobia praetiosa is in general use and it is one of the best known species in this country. It is commonly called the clover mite and is a serious pest of various agricultural crops.

Female (fig. 51)

Dimensions: Length of body, 625  $\mu$ ; breadth of body 471  $\mu$ . The colour is reddish with grey, sometimes greenish-grey to dark brown. The body is flat; wrinkled and oval-shaped.

Dorsum. The striations are irregularly tortuous. A distinct sutural line occurs between the propodosoma and the hysterosoma. There are 14 pairs of leaflike setae (fig. 52) present on the dorsum. Two eye corneae are situated on each side over and behind coxa II. The front of the propodosoma is provided with four projections, (fig. 53) the median pair of which are the longest. Each protuberance is tipped with a leaflike seta .

Venter. Ventrally, the setae are long and fine.

Gnathosoma. The mandibular plate is oval and slightly incised in front. The frontal tracheae terminate externally as sausage-like processes. The palpus (fig. 54) is four-segmented; dorsally, the penultimate segment is provided with a stout claw; apically, the thumb bears seven setae, one of which is stout and lanceolate.

Legs. The forelegs are longer than the body, whereas legs II-IV are shorter. The tarsi are provided with two strong claws. Dorsally, tarsus I bears two sets of duplex setae. The number of tactile setae borne proximad of the proximal set  
of.....

of.....

of duplex setae varies between nine and seventeen. Empodium I (fig. 55) consists of a single pair of tenent setae. Tarsi II-IV (fig. 56-57) are each provided with a padlike empodium, bearing two rows of ventrally-directed tenent setae.

The forelegs of the younger females (fig. 60) are shorter than the body and the striations on the dorsum are fainter than in the adults.

Male. Unknown.

Larva (fig. 61)

The bright red, six-legged larval stage differs from the adult therein that the dorsal setae are not leaflike but lanceolate to clavate and conspicuously setose.

Hosts and distribution. Bryobia praetiosa has a world-wide distribution and occurs throughout South Africa. It attacks deciduous fruit trees and numerous other plants. The following is a list of host plants on which this mite has been found. These were collected in the Western Province and the Transvaal. Prunus amygdalis, P. persica, P. domestica, Pirus communis, P. malus, Vitis sp., Prunus armeniaca, Cydonia vulgaris, Daucus carota, Medicago sativa, Ficus carica, Althaea rosea, Passiflora quadrangularis, many kinds of grasses and weeds.

Discussion. Geijskes (1939) pointed out that Bryobia praetiosa is not a sharply delineated species and that a number of subspecies or races occur on different hosts. Meltzer (1955) compared specimens from apples, pears and ivy and found differences in the body-shape and in the propodosomal projections of the different forms.

Differences are observed in the relative length and breadth of the anterior propodosomal projections of the South African representatives of this mite occurring on trees and herbaceous plants. The propodosomal projections of the  
mites.....

mites.....

mites which occur on herbaceous plants differ from those of the mites occurring on trees, but these differences are not consistent. The following are the variations found in the specimens collected.

a. The projections are shorter than usual and the indentation between the projections are not very deep (fig. 62).

b. The projections are shorter than those of the above mentioned (fig. 62) and the median projections are well separated (fig. 63).

c. The projections are longer and stronger than usual. The indentations between them are also deeper (fig. 64).

d. The indentations are much the same as that of the form which is shown in fig. 62; but the projections are broader (fig. 65).

e. The projections are short and strong and differ from the common form (fig. 66).

The projections of the tree-form are usually short and not as strong as those found in the herbaceous form. There is found that this form also occurs on the Hollyhock and Granadilla. The herbaceous form in which the projections are strong and long ~~was~~ not found on trees. The mites in which the projections are of the normal length and breadth include specimens from trees as well as herbaceous plants. In many cases this can be accounted for by the fact that these forms drop onto the grass and herbaceous plants in the vicinity of the trees.

Pritchard & Baker (1955) found that specimens, which occurred on apple-trees in England, California and Chile appear to have the distal enlargement of the peritreme shorter and more globular and that it does not project anteriorly when the stylophore is protracted. Similar conditions obtain in some South African specimens from apple and plum trees. In specimens from the hollyhock, quince and granadilla the peritremal

enlargement.....

enlargement.....

enlargement is slender and protrudes antero-laterally. This condition is also very pronounced in the forms found on carrots.

Other differences observed in the carrot form are the longer forelegs which also bear setae which are longer than those in the normal forms.

TRIBE PETROBIINI REKK, 1952

This tribe differs from the tribes of the Bryobiinae in the fact that the hysterosoma possesses only five pairs of dorsolateral and dorso-sublateral setae (the second and third dorsolateral setae are single, rather than paired). In many species the inner sacral setae are placed medially, in which case they resemble a fourth pair of dorsocentral hysterosomal setae; in others they are situated marginally with the result that the mite has three pairs of caudal setae. The true claw either consists of a slender pad bearing many pairs of tenent setae or the pad may be small with less setae; in some cases the claw may even be reduced to a single pair of tenent setae.

Genus APLONOBIA Womersley, 1940

Mites of this genus may be identified by the presence of a padlike empodium which is provided with two rows of tenent setae. The dorsum is provided with three pairs of propodosomal setae; the inner sacral setae resemble the dorsocentral setae and give the impression of being part of the latter series.

Aplonobia histricina (Berl.), 1910

(Figs. A 67-71)

Pritchard & Baker (1955) regard Tetranychopsis histricina

Berl.....

Berl.....

Berl. as a synonym of Aplonobia oxalis Womersley. As this species does not possess twelve pairs of dorsal hysterosomal setae, characteristic of the Bryobiinae, these authors formed the new combination of Aplonobia histricina. The possession of ten pairs of dorsal hysterosomals in this mite justifies its inclusion in the tribe Petrobiini.

Female (fig. 67)

Dimensions: Length of body 820 $\mu$ ; breadth of body 676 $\mu$ .  
The body is oval-shaped.

Dorsum. The dorsum is provided with 13 pairs of stout, serrate setae (fig. 68) which arise from strong tubercles and reach about as far as the distances between their bases. As in other species of this genus the dorsocentrals are present. Judging from the figures given by Pritchard & Baker (1955) these setae are situated further from each other in the South African specimens than in the Australian forms. There are numerous, closely set striations on the dorsum. The eyes are normal.

Gnathosoma. The mandibular plate is oval and somewhat notched in front. The frontal tracheae (fig. 69) protrude externally. Dorso-terminally, the penultimate segment of the palp (fig. 70) is provided with a stout claw; antero-ventrally, the penultimate segment bears the ventrally-directed thumb; the latter is subcylindrical and bears apically seven setae, one of which is clavate.

Legs. In the South African specimens the front legs are slightly longer than the body while the front legs of the Australian form are shorter than the body. Tarsus I (fig. 71) is shorter than tibia I and 15-16 setae are borne proximad of the proximal set of duplex setae. The claws are modified into  
pads.....

pads.....

pads, terminating in two tenent setae. The empodium consists of a pad which is twice as long as the pad of the true claw. The empodial pad bears a series of ventrally-directed tenent setae.

Hosts and distribution. Specimens of this mite were found on Pirus communis, collected in the Eastern Transvaal.

Genus PETROBIA Murray, 1877

Pritchard & Baker (1955) pointed out that several long existing genera such as Tetranychina etc. actually are synonyms of Petrobia. The members of this genus reveal the following distinctive character: The empodium is uncinata and provided with two rows of ventrally-directed tenent setae.

Petrobia harti (Ewing), 1909

(Figs. A 72-78)

Specimens referred to under the name Petrobia harti were, for many years, known under the name Tetranychina harti. The new combination of Petrobia harti was made by Pritchard & Baker (1955). Originally P. harti was included in the genus Necphylobius by Ewing.

Female (fig. 72)

Dimensions: Length of body 639  $\mu$ ; breadth of body 561  $\mu$ . The colour is dark orange-red. The body is oval-shaped in dorsal aspect.

Dorsum. The 26 body setae (fig. 73) are rodlike and setose. They arise from tubercles and are longer than the distances between their bases. The clunal setae are shorter than the other hysterosomals. The usual perfect and imperfect eye cornea occurs on each side.

Gnathosoma. The mandibular plate is rounded in front. The penultimate segment of the palpus (fig. 74) has a stout claw; the last segment bears seven setae, one of which is spindle-shaped.

Legs. The fore-legs are twice as long as the body. The tarsi of the legs are much shorter than the tibiae. Tarsus I (fig. 76) is dorso-distally provided with two sets of duplex setae; 17-18 setae are borne proximad of the proximal set of duplex setae. The empodium forms a terminal hook which bears two rows of tenent setae.

In the immature stages the legs are relatively shorter than those of the adults.

Male (fig. 77)

Dimensions: Length of body 338  $\mu$ ; breadth of body 232  $\mu$ . The body is much smaller and narrower than in the female and the legs are relatively longer, being about three times as long as the body. The dorsal setae are much shorter than those of the female and not set on prominent tubercles. The first pair of dorso-central hysterosomals are long and slender while the second to "fourth" (the inner sacrals) pairs are shorter. The aedeagus (fig. 78) is straight and devoid of a knob; distally it gradually tapers to the thin truncated tip.

Hosts and distribution. Host plants from which these mites were collected in the Western Province and the Transvaal are: Pennisetum longistylum and Trifolium sp.

Petrobia latens (Müller), 1776

(Figs. A 79-83)

This species which was described by Müller (1776) as Acarus latens was transferred by Oudemans (1915) to the genus Petrobia .



Female (fig.79)

Dimensions: Length of body 510 $\mu$ ; breadth of body 380 $\mu$ .  
The body is broadly oval.

Dorsum. The striations on the middle of the dorsum are transverse but mostly longitudinal on the dorso-lateral sides. Thirteen pairs of lanceolate setose setae (fig. 80) are present; all the setae are distinctly shorter than the distances between the bases of consecutive setae. The eyes are normal.

Gnathosoma. The mandibular plate is oval and rounded in front. The frontal tracheae (fig. 81) protrude externally and form slender peritremal enlargements. The palpus (fig. 82) is four-segmented; the penultimate segment bears a stout claw; the last segment is provided with the usual seven setae on its distal third, one of which is clavate.

Legs. The fore-legs are longer than the body whereas the other legs are shorter. According to McGregor (1950<sup>b</sup>) tarsus I (fig. 83) is about as long as tibia I and according to Womersley (1940) the tarsi are slightly shorter than the tibiae but in the South African specimens tarsus I is about three-fourths the length of tibia I. The empodium is clawlike and provided with a series of ventrally-directed tenent setae along each side.

Male. Unknown, reproduction is parthenogenetically.

Hosts and distribution. Specimens were found in the Eastern Province, Transvaal and Orange Free State on the following host plants: Triticum vulgare, Morus sp., Phleum pratense and Cichorium intybus.

Genus PARAPETROBIA, n.gen.

The empodium in this genus is uncinata. It differs from the genera Petrobia and Schizonobia in that the empodium has two rows of dorsally-directed tenent setae. As regards the number of setae on the empodium it constitutes a position intermediate between these two genera.

As in other members of the subfamily Bryobiinae there are two sets of duplex setae present at the abruptly declivate distal end of tarsus I. It, however, differs from them in having proximally another two sets of duplex setae of which the proximal member of each set is longer than the proximal member of the distal duplexes. The distal members are much shorter. The thirteen pairs of dorsal body setae are arranged in four transverse rows. As in Schizonobia the fore-legs of the female are not lengthened. The peritremes resemble those of Petrobia.

Parapetrobia capensis, n.gen., n.sp.

(Figs. A 84-87)

Female (fig. 84)

Dimensions: Length of body 661  $\mu$ ; breadth of body 500  $\mu$ . The colour is dark-grey with a dorso-medial lighter region. The body is oval-shaped.

Dorsum. The dorsal integument is provided with fine striations which are mostly transverse at the dorsocentral area of the hysterosoma and longitudinal laterally. Thirteen pairs of dorsal body setae, which are rodlike to lanceolate and coarsely setose, are set on prominent tubercles. These setae are arranged more or less in four transverse rows. The eyes could not be observed.

Gnathosoma. The mandibular plate is oval and rounded in front. The trachea (fig. 86) ends in a rounded anastomosing chamber. The palpus (fig. 85) is four-segmented; the penultimate segment is dorsally provided with a strong claw; the last segment of the palpus is subtended from the preceding segment. The thumb is two times as long as it is broad and bears four stout setae apically and one additional seta on each side of the segment.

Legs. The fore-legs are not lengthened and covered with setose setae. All the tarsi bear uncinata empodia, the hook bearing two rows of dorsally-directed tenent setae. In this respect it differs from Petrobia latens which has ventrally-directed tenent setae on the clawlike empodium. Each row consists of five to eight tenent setae which are fewer than those of Petrobia latens. Tarsus I (fig. 87) is provided with the usual two sets of duplex setae at the declivate distal end but it differs from other Tetranychidae by the presence of another two sets of duplex setae more proximally on tarsus I. The proximal member of this set is longer than usual and one of them is setose. Tarsus II has the usual one set of duplex setae.

Male. Unknown.

Host and locality. One holotype female from an unidentified wild low-growing plant, Grabouw, Cape Province, January 1955.

FAMILY TENUIPALPIDAE BERL., 1913

The family Tenuipalpidae was known under several different names such as Phytoptipalpidae, Ewing, 1922, Pseudoleptidae Oudemans, 1928 and Trichadenidae Oudemans, 1938. Baker & Wharton (1952) retained the name given by Ewing, 1922 but recently Cunliffe suggested that the name Tenuipalpidae, which has priority, should be used.

The members of this family can be recognised by a simple palpus; the tetranychid type of palpal claw is absent. The terminal segment of the palpus is distinctive in bearing a rodlike sensilla and one or two setae. It also differs from the other Tetranychoida in the fact that the palp often has less than five segments.

The dorsal chaetotaxy is of considerable value for the identification of these mites. The propodosoma bears three pairs of dorsal setae. However, both the arrangement and number of hysterosomals (9-13 pairs) vary within the family. The genital plate of the female is well developed and provided with two (rarely one) pairs of setae.

Key to the South African species of the family Tenuipalpidae

1. Palpus with four segments.....Brevipalpus Donnadieu
  - a. Dorsolateral hysterosomals unusually large; body with a distinct constriction posterior to leg IV.....B. natalensis (Lawrence)
  - . Dorsolateral hysterosomals short; body without a constriction posterior to leg IV.....b
  - b. Hysterosoma with six dorsolaterals; propodosoma reticulated mediodorsally although usually somewhat fainter.....B. californicus (Banks)

- . Hysterosoma with five dorso-laterals; propodosoma without reticulations dorsomedially...B. inornatus  
Banks
  
- . Palpus with three segments.....2
  
- 2. Hysterosoma with three pairs of dorsocentral setae; rostral plate well developed.....Tenuipalpus Donnadieu
  - a. Body oval-shaped; second pair of dorsocentral setae very long.....T. ovalis, n.sp.
  
  - . Body with a very broad podosoma and slender opisthosoma; second pair of dorsocentral setae relatively short.....b
  
  - b. Hysterosoma with seven pairs of lateral setae, the sixth being flagellate.....c
  
  - . Hysterosoma with six pairs of lateral setae, the flagellate seta being absent.....  
T. quadrisetosus Lawrence
  
  - c. Third pair of dorsal propodosomals more than half the length of the propodosoma; lateral projection of body just anterior to coxa III broadly subquadrate.....T. micheli  
Lawrence
  
  - . Third pair of dorsal propodosomal setae much shorter than the length of the propodosoma; lateral projection of the body just anterior to coxa III slender, subconical.....T. podocarpi  
Lawrence
  
- . Hysterosoma with two pairs of dorsocentral setae; rostral plate.....

plate.....

plate absent.....Dolichotetranychus Sayed

a. With two pairs of anal setae; femur II with a relatively long dorsal seta; hooks on tarsal claws completely absent; rostrum with a pair of ventral setae; female with two pairs of genital setae; male with tibia IV slightly more than half the length of the genital stylets.....D.salinas Pritchard & Baker

--. With one pair of anal setae; femur II with a relatively short dorsal seta; tarsal claw without a hook; male with tibia IV more than two thirds the length of the genital stylets.....D. macer Pritchard & Baker

Genus BREVIPALPUS Donnadieu, 1875.

This genus with its oval-shaped body may be recognised by its four-segmented palp. The dorsum is covered with reticulations. The dorsal body setae are usually short and serrate or pectinate. The propodosoma is dorsally provided with three pairs of setae; the dorsosublateral hysterosomal setae are absent. The presence of either one or two sensory rods dorsodistally on tarsus II of the female is used for the separation of species groups.

Brevipalpus natalensis (Lawrence), 1943

The distinctive characteristics of this species are the following: The legs are short and the femurs are provided with rounded knob-like processes; the tarsal claws are long and strong and the tarsi are provided with very long sensory setae; ventrally, a transverse band of about seven chitinous ridges

are.....

are.....

are present posterior to leg IV; on the dorsal surface there is a distinct constriction posterior to leg IV; the dorso-lateral hysterosomals are unusually large; the body is small.

Described by Lawrence (1943) under the name Tenuipalpus natalensis, from Halleria lucida.

Brevipalpus californicus (Banks), 1904

(Figs. B 1-2)

Synonym: Brevipalpus australis (Tucker), 1926.

Female

Dimensions: Length of body, 289  $\mu$ ; breadth of body, 161  $\mu$ .

Anteriorly, the body is broad and rounded, tapering posteriorly.

Dorsum (fig. 1). The propodosoma has three pairs of marginal setae while the hysterosoma is provided with seven, six of which are dorsolaterals and one a humeral seta; these setae are short and slightly lanceolate and provided with a few serrations. The three pairs of dorsocentral hysterosomals are short and of equal length. The propodosoma is covered with a reticulated pattern in which the elements are about as long as they are wide; dorsomedially the network is not as strong as it is mediolaterally. The hysterosoma is covered with a reticulated pattern in which the marginal elements are longer than wide. In the region between the dorsal setae the pattern is faint and does not form complete "cells" as they do on other parts of the dorsum. Two eye corneae are present on each side of the body.

Venter (fig. 2). The reticulated pattern of the ventral plates.....

plates.....

plates consists of elements which are wider than long. The reticulated elements anterior to the ventral plate are also wider than long but elsewhere the reticulated elements tend to be longer than wide. The genital plate is provided with four setae which are situated near its posterior border. The ventral plate has one pair of setae. There are two pairs of medioventral metapodosomals of which the posterior pair are the longest. A pair of long setae are present beneath coxa I.

Gnathosoma. The front margin of the rostrum does not reach past the middle of femur I; the rostral plate is provided with long inner and smaller lateral lobes. Each of the palpi consists of four segments of which segment II is the longest.

Legs. The legs are shorter than the body; the surface of the segments are rugose. The tarsi are abruptly truncated at their tips and each bears a pair of stout claws and an empodium. The knobbed tenent setae arise from both the claws and the empodium. Tarsus II bears two short rodlike sensory setae. The dorsal setae of both femur I and II are short, lanceolate and serrate.

Male. Not found.

Nympha. The marginal setae are longer than those of the female and are lanceolate and serrate.

Hosts and distribution. Specimens were found in the Western Province, Natal and the Transvaal on the following host-plants: Citrus sp. , Rosa sp., unidentified weeds.



Brevipalpus inornatus (Banks), 1912

(Figs B 3-7)

Female.

Dimensions: Length of body, 274  $\mu$ ; breadth of body 189  $\mu$ . It is scarlet-red in colour. In dorsal view the body is egg-shaped.

Dorsum (fig. 3). Three pairs of short, lanceolate, serrate setae are present on the propodosoma whereas the hysterosoma is provided with five pairs of dorsolateral hysterosomals and one pair of humeral setae. These setae are short, lanceolate and serrate. The three pairs of dorsocentral hysterosomals are short and setiform. Two eye corneae occur at the humeral angle of the propodosoma and are subequal in size. The elements of the reticulated pattern on the propodosoma are slightly longer than wide and do not meet dorsally. The elements of the pattern on the hysterosoma differ from those on the propodosoma and are more or less wider than they are long; those on the lateral side of this area are longer than they are wide.

Venter (fig. 4). On the ventral and genital plates the reticulated elements are wider than long; anterior to these plates the elements are small and also wider than they are long. Elsewhere the elements are slightly longer than they are wide. The genital plate has four setae which are situated near to its posterior border. The ventral plate bears two setae. The posterior medioventral metapodosomals are of normal length, reaching to the suture between the propodosoma and the hysterosoma.

Gnathosoma. A finely punctated rostral plate overlies  
the.....

the.....

the rostrum as well as trochanter I and II; it has three pairs of frontal lobes. The palpus (fig.5) has four segments of which segment II is the longest; antero-dorsally the latter is provided with a long pectinate seta.

Legs. The legs are short and stout; each of the tarsi has two stout, curved claws (fig. 6) which bear a number of tenent setae; the empodium between the claws is also provided with tenent setae. Tarsus II has a single rodlike sensory seta. The dorsal setae of femora I and II are lanceolate and serrate.

Male. Not found.

Nympha (fig.7). The marginal setae of the nymph are longer than those of the female and are lanceolate and serrate. The dorsal hysterosomal setae are small and simple.

Hosts and distribution. The following is a list of host plants on which this mite has been found. These were collected in all parts of South Africa. Pittosporum viridiflorum, Pelargonium sp., Mentha crispa, Citrus limonia, Ficus carica, Dahlia sp., Carica papaya, Vitis sp., Pharbitis hispida, Viola odorata, Hibiscus rosa sinensis, Erythrina caffra, many unidentified grasses and weeds.

Genus TENUIPALPUS Donnadieu, 1875

The members of this genus can usually be recognised by the broad podosoma and narrow opisthosoma. This characteristic is not applicable to all species because the shape of the body of the new species, T. ovalis described below is similar to that of Brevipalpus. The palpi are three -segmented; the venter of the rostrum possesses a pair of feathered setae; the anterior  
end.....

end.....

end of the stylophore lacks or nearly lacks transverse ribs; the fifth dorsolateral hysterosomal seta is flagelliform; one or both pairs of medioventral podosomal setae may be doubled and the anterior setae are displaced to the propodosoma.

Tenuipalpus ovalis, n.sp.

(Figs. B 8-12)

Tenuipalpus ovalis differs from other members of the genus in that the body is oval-shaped as in the genus Brevipalpus. The three-segmented palpus, the presence of a pair of feathered setae on the venter of the rostrum and the flagelliform fifth dorsolateral hysterosomal seta however indicate that this species should be referred to the genus Tenuipalpus.

Female.

Dimensions: Length of body, 280  $\mu$ ; breadth of body, 175  $\mu$ ; length of leg I, 110  $\mu$ ; leg II, 89  $\mu$ ; leg III, 70  $\mu$ , leg IV 88  $\mu$ .

Dorsum (fig.8). The propodosoma has a few irregular striations. The first and third dorsal propodosomal setae are of medium length, lanceolate and serrate; the second pair are much longer, linear-lanceolate and serrate. The hysterosoma is provided with a few large longitudinal striations, the other striations being irregular or transverse. The first pair of dorsocentral setae are of medium length and lanceolate-serrate; the second pair are very long, linear-lanceolate and serrate; the third pair are shorter than the first pair and are also lanceolate-serrate. The humeral setae are short. The dorsolateral setae are six in number of which the fifth is flagelliform; the others are short and lanceolate-serrate. The usual two eye corneae are present.

Venter (fig.9). Tenuipalpus ovalis agrees with T.granati

in.....

in.....

in the presence of only one pair of anterior medioventral podosomal and two pairs of posterior medioventral podosomal setae.

Gnathosoma. The rostral shield has a pair of deeply divided median lobes. The palpi (fig. 10) are three-segmented, the terminal segments each bearing a single sensory seta distally and a short seta laterally; terminally the second segment is provided with a long slender seta.

Male. Unknown.

Nympha (fig. 11). The propodosoma bears two pairs of linear-lanceolate setose setae of which one pair are very long; the other pair are of moderate length. The first pair of dorsocentral hysterosomal setae are very long whereas the second pair are about three-quarters as long as the former; the setae of both pairs are linear-lanceolate and setose. The dorsolateral hysterosomal setae are broadly lanceolate.

Larva (fig. 12). Similar to nymph except that the dorsocentral hysterosomal<sup>50</sup> setae are absent and that the dorsolateral hysterosomal setae are slender.

Hosts and distribution. One holotype female, two paratype females, one nymph and one larva from the leaves of an unidentified wild shrub, Kaap Muiden, April 1955.

Tenuipalpus quadrisetosus Lawrence, 1940

Tenuipalpus quadrisetosus differs from the other members of the genus Tenuipalpus by the absence of the penultimate pair of flagellate dorso-lateral hysterosomals; the hysterosoma  
of.....

of.....

of the female is characterised by conspicuous horseshoe-shaped markings; a seta which is not present in other species, occurs on femur IV; one pair of anterior medio-ventral podosomal and one pair of posterior medio-ventral podosomal are present; in the male the distal segment of the palpus bears two sensillae whereas the female possesses only one; a single, slender, curved sensory rod is situated on tarsi I and II of both the female and male. The lateral lobe of the body immediately anterior to coxa II is absent.

This species was described by Lawrence (1940) from specimens taken from Cryptocarya woodii, Stella Bush, Durban. In 1943 a new species was described by Lawrence under the name Tenuipalpus gibbus, also from Cryptocarya woodii. Baker & Pritchard (1953a) regard Tenuipalpus gibbus as a synonym of T. quadrisetus.

Tenuipalpus micheli Lawrence, 1940

The distinctive characteristics of this species are the following: A single pair of anterior and posterior medio-ventral podosomal are present; the third pair of long dorsal propodosomal are more than a half the length of the propodosoma; a broadly subquadrate lateral projection of the body occurs immediately anterior to coxa III; the dorso-lateral hysterosomal are long and lanceolate-serrate.

Lawrence (1940) described this species from Chaetacine aristata, Umhloti Beach, Natal.

Tenuipalpus podocarpi Lawrence, 1943

This species is characterised by the following: A single pair of anterior and posterior medioventral podosomal are present; the third pair of dorsal propodosomal are much shorter than.....

than.....

than the propodosoma; a slender subconical body projection occurs immediately anterior to coxa III; as in T.micheli the dorso-lateral hysterosomals are large and lanceolate-serrate.

Tenuipalpus podocarpi was collected from Podocarpus falcata, Cathkin Peak, Drakensberg Mountains, Natal and described by Lawrence (1943).

Genus DOLICHOTETRANYCHUS Sayed, 1938

Dolichotetranychus was created by Sayed in 1938, the species of this genus formerly being accommodated in the genus Pseudoleptus. Vitzthum (1942) considered Dolichotetranychus to be a synonym of Pseudoleptus but Sayed (1942) demonstrated that the two genera are distinct.

The members of this genus may be recognised by a three-segmented palpus, the absence of the rostral plate, the hysterosoma with two pairs of dorsocentrals and one pair of dorsosublaterals, and the opisthosoma bearing five pairs of dorsolateral setae.

Dolichotetranychus salinas Pritchard & Baker, 1951  
(Figs. B 13-16)

Female

Dimensions: Length of body, 270  $\mu$ ; breadth of body, 132  $\mu$ . Anteriorly, the body is rounded but tapers posteriorly.

Dorsum (fig. 13). There is a distinct division between the propodosoma and the hysterosoma. The usual two eyes are present on each side of the body. The dorsal striations on the body are mostly longitudinal and punctate except for the anterior portion of the propodosoma where the striations are transverse. The propodosoma has three pairs of short propodosomals.....

propodosomals.....

propodosomals. The hysterosoma bears five pairs of dorsolaterals of which the fourth pair are the longest. The dorsocentrals and humeral setae are short.

Venter (fig. 14). Ventrally, the striations are longitudinal except for an area near the middle of the body where they are transverse. The genital plate is provided with two pairs of setae near its posterior border. The anterior medioventral metapodosomals are long while the posterior pair are short. Two pairs of anal setae are present.

Gnathosoma. Terminally, the three-segmented palpus has a long dorsal seta and a slender sensory rod.

Legs. The legs are shorter than the body. The dorsal seta present on each of femurs I and II and tibiae I and II are very long; tarsi I and II are each provided with a sensory rod; the claw (fig.15) is devoid of a hook, the outer tenent setae are fused and much longer than the claw pad.

Male (fig.16).

Dimensions: Length, 231  $\mu$ ; breadth, 129  $\mu$ . The body is slender. Anteromedially, the propodosoma has transverse dorsal striations; the striations are longitudinal in other regions of the dorsum; medially, the striations on the metapodosoma are in the form of an X. On the opisthosoma they are mostly longitudinal except for transverse ones caudally. The third, fourth and fifth hysterosomals are shorter than those of the female. The palpus is provided with a short dorsal seta on the third segment and terminally it bears a long sensory rod and a short sensory seta. The genital stylets are stout and sharp-pointed; tibia IV is slightly more than half the length of the genital stylets.

Host and distribution. Specimens were found on Cynodon  
bradlii from Transvaal, Transkei, Kokstad, and Modderfontein.

Dolichotetranychus macer Baker & Pritchard, 1956

This species can be recognised by the absence of a hook on the tarsal claws and by the presence of a short dorsal seta on femur II. In contrast to D. salinas the female of this species possesses a single pair of anal setae; tibia IV of the male is more than two-thirds the length of the genital stylets. According to Baker & Pritchard the dimensions of this species are as follows; Length of body: female, 316  $\mu$ , including gnathosoma 406  $\mu$ ; male, 226  $\mu$ , including gnathosoma 290  $\mu$ . Breadth of body: female, 126  $\mu$ ; male, 93  $\mu$ .

Dolichotetranychus macer is known only from South Africa. It is found in the Cape Province on Aristida namaquensis in 1953.

FAMILY TUCKERELLIDAE BAKER & PRITCHARD, 1955

This family was created for the genus Tuckerella Womersley which was formerly included in the family Tetranychidae. This is also the only known genus in the family.

The diagnostic characteristics of a tuckerellid are the following: The dorsal chaetotaxy is distinctive. In the known species there are four pairs of fan-like dorsal propodosomal setae and 36 pairs of fan-like dorsal hysterosomal setae. Caudally six pairs of flagellate setae are present. The dorsal integument is reticulated. The fifth palpal segment is long and slender and is provided with two sensory rods and three tactile setae. The fourth segment bears a slender curved spur. As in members of the Tenuipalpidae and Linotetranychidae tarsi I and II each has one or two distal sensory rods. The genital and ventral plates are absent in the female.



Genus TUCKERELLA Womersley, 1940

These unique mites are plant-feeding and only two species are known namely T. ornata (Tucker) and T. pavoniformis (Ewing). Womersley (1940) created this genus for specimens which he identified as Tenuipalpus ornata Tucker but which was actually T. pavoniformis. The characters of the family can be applied here.

Tuckerella ornata (Tucker), 1926

Tuckerella ornata can be recognised by the five pairs of posterior flagellate setae; the antero-distal sensory rod of tarsus I is as long as, but more slender than the postero-distal sensory rod; antero-distally, tarsus II is provided with a slender sensory rod; leg IV bears slender setae dorsally; the outer pair of the last four fan-like setae on the dorsum of the body are smaller and situated more posteriorly than the inner pair.

This species was originally described as Tenuipalpus ornatus from orange fruits in the Western Cape Province and Transvaal. Baker & Pritchard (1953b) also studied specimens collected from citrus, Natal.

SUPERFAMILY RAPHIGNATHOIDEA GRANDJEAN, 1944

The members of this superfamily can be recognised by the following characteristics: The palpal thumb-claw complex is constant throughout this superfamily except in one family namely the Cryptognathidae; no dorsal sensory areas are present on the propodosoma; in some cases the chelicerae may be fused medially; the movable chela is small and styletlike; the fixed chela is never strongly developed. The tarsal claws are simple; the empodia are present and are provided with tenent setae as in the Tetranychoidae. The superfamily Raphignathoidea comprises the families Raphignathidae Kramer, 1877, Stigmaeidae Oudemans, 1931, Caligonellidae Grandjean, 1944, Pomerantziidae Baker, 1949 and Cryptognathidae Oudemans, 1902.

FAMILY CALIGONELLIDAE GRANDJEAN, 1944

The family Caligonellidae was created by Grandjean for the genus Caligonella, on the basis of distinctive features of the respiratory apparatus associated with the mouthparts. Baker & Wharton (1952) considered the Stigmaeidae and Caligonellidae as synonyms of the Raphignathidae. More recently, Summers & Schlinger (1955) retained the family Caligonellidae.

The members of this family are small, reddish-coloured predacious mites which exhibit the following diagnostic characteristics: The inflated basal segments of the stylate chelicerae are fused with each other in the midline and form a conical stylophore which bears, on its dorsal surface, a pair of sinuous peritremes; the latter are confined to the stylophore as alveolate channels. The palpal thumb-claw complex is not strongly developed. The palpi are five-segmented and are usually provided with a single well defined claw on the penultimate.....

penultimate.....

penultimate segment; the palptarsus is slender, cylindrical and apically equipped with stubby setae, none of which are three-partite or comblike. The integument of the dorsum is finely striated. The number of eyes varies between nil and two pairs. Coxae I-II and III-IV are adjoining. The pretarsi are provided with two claws and falciform empodia which bear two or more pairs of tenent setae.

Genus NEOPHYLLOBIUS Berl., 1886

The species of this genus constitute a homogeneous taxonomic group, yet their affinities with other genera are not clear. In the past they were classified with the red spider mites of the family Tetranychidae. Southcott (1954) created the family Neophyllobiidae for this genus. McGregor (1950 a) referred it to the Stigmaeidae whereas Summers & Schlinger (1955) referred it to the family Caligonellidae by virtue of the anatomy of the mouthparts.

The genus Neophyllobius is characterised by the short slender five-segmented palpus which is devoid of a strong claw on the penultimate segment; the latter bears two or more setae, one of which may be bladelike. The rostrum is short and in some cases hidden. The body is small and rotund to ovate. The dorsal body setae are peglike, lanceolate or clavate, obscurely to conspicuously setose, and often set on tubercles. The mandibular plate is present; the stylets are needlelike and recurved basally. The legs are very long; the patellae are sometimes provided with a whiplike seta; a barely visible spine is often present on patellae I and II; subterminally each tibia often bears a very minute naillike seta; the segments bear a few setae which mostly arise from tubercles; the tarsi are much shorter than the tibiae and are often swollen at the middle;

.....

a.....

a spindle-shaped seta occurs on the tarsi; duplex setae are absent. The tarsus is provided with two claws and an empodium which bears two rows of tenent setae. The males are unknown.

Key to the South African species of the genus  
Neophyllobius.

1. Patellae I-III each with a seta which is about as long as the segment; the seta on patella IV is shorter than the tibia of this leg; the majority of the dorsal body setae are shorter than the distances between their bases.....

N. natalensis, n.sp.

---. Patellae I-II each with a seta which is much longer than the segment; the seta on patella III is about as long as the tibia of this leg; the majority of the dorsal body setae are longer than the distances between their bases....

N. cavumarboris, n.sp.

Neophyllobius natalensis, n.sp.

(Figs. C 1-3)

This species differs from most other species of Neophyllobius in the relative length of the dorsal body setae. It closely resembles N. texanus, McGregor.

Female (fig.1).

Dimensions: Length of body, 300  $\mu$ ; breadth of body, 240  $\mu$ ; length of leg I, 390  $\mu$ ; leg II, 310  $\mu$ ; leg III, 390  $\mu$ ; leg IV, 450  $\mu$ . The body is oval-shaped.

Dorsum. The striations are irregular and the areas which embrace the bases of the dorsal setae are less distinctly striated.....

striated.....

striated. In this respect it resembles N.summersi McGregor. McGregor (1950 a) did not figure the dorsal striations of N.texanus with the result that it cannot be compared with the present species. The majority of the 17 pairs of linear-lanceolate coarsely serrate dorsal body setae are shorter than the distances between the bases of the consecutive setae. The chaetotactic pattern is as follows: A frontal seta over the base of each palpus, seven submarginal setae along each side, one seta on the lateral margin immediately anterior to and one immediately posterior to trochanter III, five pairs of submedian setae, and four short setae subcaudally. The dorsal setae and most of the setae of the legs are borne on small tubercles. One perfect and one imperfect eye cornea are situated just in front of the third sublateral seta.

Gnathosoma. The rostrum and palpi are short. The palpi are not as inconspicuous as in N.texanus. The second segment of the palpus is the longest and distally bears a setose seta which is as long as the segment; laterally, a similar but smaller seta is present. The third segment has a dorsally situated lanceolate seta; dorsoterminally, the fourth segment bears a strong bladeliike seta; the last segment is small and bears four setae near its tip. The mandibular plate is small and rounded in front.

Legs. The legs are much longer than the body. All the tarsi are swollen and dorso-terminally each bears two lanceolate, non-duplex setae, which are fully half as long as the segment; subbasally, tarsus I and II each bears a minute, finger-shaped seta. Distally, the tibiae are each provided with a short naillike seta. Patellae I-III each bears a linear, slightly thickened, setose seta. Differing from N.texanus,

where.....

where.....

where this seta is twice as long as its corresponding segment, its length is the same as that of the patella. The linear seta on patella IV is shorter than tibia IV. As in N. texanus patella I and II are also each provided with a minute, barely visible spine. Tibiae and tarsi are sparsely covered with lanceolate setose setae of which some are relatively long; the trochanters and femurs bear short, oblong to spatulate setose setae. The tarsus is provided with two strong hooked claws and an empodium which is padlike; along each side the latter is provided with a series of short tenent setae, the number of which could not be ascertained.

Male. Unknown.

Host and locality. One holotype female from an unidentified wild tree, Munster, Natal, April 1955.

Neophyllobius cavumarboris, n.sp.

(Figs. C 4-10)

Neophyllobius cavumarboris is closely related to N. summersi. These two species are separated from each other by the relative length of the seta on patella II and III.

Female

Dimensions: Length of body 350  $\mu$ ; breadth of body 300  $\mu$ ; length of leg I 500  $\mu$ , leg II 350  $\mu$ , leg III 490  $\mu$ , leg IV 520  $\mu$ . The body is rotund.

Dorsum (fig. 4). As in N. summersi the striations are irregular and the areas which embrace the bases of the dorsal setae are less distinctly striated. The majority of the fifteen pairs of linear-lanceolate, coarsely serrate dorsal body setae are longer than the distances between their bases and.....

and.....

and are distributed as follows: A frontal seta is situated over the base of each palpus; seven submarginal setae occur along each side; five pairs of submedian setae; four short setae subcaudally. The dorsal setae are relatively shorter than those of N. summersi. As in N. natalensis the dorsal body setae and most of the setae of the legs are borne on small tubercles. Two eye corneae are situated on each side immediately anterolateral of the third sublateral seta.

Gnathosoma. The rostrum is small and ovate; the palpi are short and consist of five segments; the second segment is provided dorsally with a setose seta which is slightly longer than the segment and a similar but smaller seta laterally; dorsally, the third segment has a lanceolate seta; the fourth segment bears a strong blade-like seta; the last segment is provided with four setae near its tip. The mandibular plate is small and rounded in front.

Legs (fig. 7-10). The legs are all longer than the body, legs I and IV are the longest; the setae of the legs are mostly stiff, linear-lanceolate, finely setose, and most of them are longer than the distances between their bases; the tarsi are much shorter than the tibiae and are somewhat swollen at the middle; the duplex setae are absent; the patellae are very short; patella I and II each bears a long linear, setose seta and an almost imperceptible spine; the linear seta on patella II differs from that of N. summersi in the fact that it is more than two-fifths as long as tibia II; the linear seta on patella III is more or less as long as the tibia of the corresponding leg and in this respect it also differs from N. summersi where this seta is shorter than the tibia. All the tibiae bear a short nail-like seta, subdistally. Dorsally, near their bases tarsus I and II are each provided with a spindle-shaped sensilla. The tarsus is provided with two strong hooked claws and an empodium which consists.....

consists.....

consists of a pad and tenent setae.

Male. Unknown.

Host and locality. One holotype female from a hole in a willow tree, Potchefstroom, May 1956.

FAMILY STIGMAEIDAE OUDEMANS, 1931

In 1931 Oudemans proposed the family Stigmaeidae for the raphignathid genera which have either independent or fused chelicerae and superficial tracheal trunks on the antero-lateral margins of the propodosoma. Baker & Wharton (1952) considered the Stigmaeidae as a synonym of the Raphignathidae on the ground that there are no clear-cut family characters. Cunliffe (1955) retains this family and separates it from the other raphignathid mites by the following characteristics: The coxae are arranged into two distinct groups; the genital and anal openings of the female are contiguous; the peritremes do not reach into the chelicerae; an empodium is present between the two claws of the tarsus. The members of this family are predators.

Key to the South African genera and species of the family

Stigmaeidae.

- 1. Palpal tarsus with a three-partite spine.....2
- . Palpal tarsus without a three-partite spine.....4
  
- 2. Entire dorsum reticulated; dorsal setae set on tubercles.....Ledermülleria Oudemans
  - a. Dorsal setae spinelike; 87-109 $\mu$  long; elements of network with thick margins; suture between propodosoma and hysterosoma absent; length of body (excluding.....



(excluding.....

(excluding gnathosoma) 256  $\mu$ ; length (including gnathosoma) 338  $\mu$ ; breadth 236  $\mu$ ...L. neamaculata, n.sp.

--. Dorsal setae linear-lanceolate; 166  $\mu$  long; elements of network with relatively thin margins; integumental ridges present; length of body (excluding gnathosoma) 416  $\mu$ ; length (including gnathosoma) 600  $\mu$ ; breadth 354  $\mu$ ...L. lineolata, n.sp.

--. Dorsum not reticulated; integument between the dorsal plates striated; dorsal setae linear-lanceolate and not set on tubercles.....3

3. Palpi strong and thick resembling those of the Cheyletidae but not as thick and strong as those of the related genus Cheylostigmaeus; dorsum with a large propodosomal and hysterosomal plate and two or four smaller plates in region between propodosoma and hysterosoma; palpal tarsus shorter than claw.....Villersia Oudemans

a. Propodosomal plate with four pairs of setae; hysterosomal plate with five pairs; only two small plates in region between propodosoma and hysterosoma; dorsal setae relatively long; length of body (excluding gnathosoma) 374  $\mu$ ; length (including gnathosoma) 470  $\mu$ ; breadth 308  $\mu$ ...V. oudemansi, n.sp.

--. Palpi slender; dorsum with a large propodosomal and hysterosomal plate which may be accompanied by a number of smaller plates ; palpal tarsus longer than the claw.....Mediolata Canestrini

- a. Propodosoma with a single triangular plate which bears three pairs of setae; hysterosoma with one large median plate bearing five pairs of setae and two smaller plates, near the posterior margin of the median plate, each provided with one seta; length of body (excluding gnathosoma) 355  $\mu$ ; length (including gnathosoma) 461  $\mu$ ; breadth 274  $\mu$ .....M. africana, n.sp.
  
- 4. Palpal tarsus very long and slender; claw reduced; dorsum with a number of large plates.....Eupalopsis Canestrini
  - a. Dorsum with four plates which are without distinct reticulations; dorsal setae relatively short; palpal tarsus cylindrical, slender and very long, with a straight distal spine; length of body (excluding gnathosoma ) 257  $\mu$ ; length (including gnathosoma 347  $\mu$ ; breadth 151  $\mu$ .....E. brevopilus, n.sp.
  
- . Palpal tarsus not very long; claw normal; dorsal plates absent; only small plates or unstriated areas around the bases of the dorsal setae.....Apostigmaeus Grandjean
  - a. Integument finely striated; middorsal region of propodosoma with an inconspicuous reticulated pattern; propodosoma with five pairs of dorsal setae; hysterosoma with nine pairs; dorsal setae relatively short.....A. navicella Grandjean

Genus LEDERMULLERIA Oudemans, 1923

Members of this genus are small rounded mites with a network on the dorsum. The palpi are short and distally each is provided.....

provided.....

provided with a strong claw and a short tarsus. A three-partite spine is present on the distal end of the palpal tarsus. The dorsal setae are spinelike or linear-lanceolate and set on tubercles.

Ledermülleria neomaculata, n.sp.

(Figs. C 11-13)

This species can be readily recognised by its rotund body and the absence of a distinct suture between the propodosoma and hysterosoma. It is near L. maculatus (Schrk.) from which it differs by its smaller size and the presence, in the latter species, of a suture.

Female (fig. 11)

Dimensions: Length of body (excluding gnathosoma) 256  $\mu$ ; length (including gnathosoma) 338  $\mu$ ; breadth of body 236  $\mu$ . The body is rotund. In this respect it differs from L. segnis (Koch) in which the body is longer than broad.

Dorsum. It differs from L. favosa Sellnick and L. maculatus in the absence of a distinct suture between the propodosoma and the hysterosoma. No dorsal plates could be observed, even under the phase-contrast microscope. The integument is reticulated. The elements of the network are provided with relatively thick walls. The dorsum bears eight pairs of spinelike setose setae (fig. 12) which are set on strong tubercles. The dorsal setae (87-109  $\mu$ ) are relatively shorter than those of L. favosa. One eye is situated immediately behind each of the second propodosomal setae.

Gnathosoma. The palp (fig. 13) reaches to the proximal margin of tibia I. The penultimate segment is provided with a  
claw.....

claw.....

claw; the palpal tarsus is cylindrical and about as long as the claw whereas in L. maculatus it is shorter than the claw; a prominent tri-partite spine is present on its distal end; three additional setae are borne on the segment. The basal portions of the chelicerae are stout and tapering whereas the distal portions are needle-like. No peritremes or stigmata could be detected.

Legs. All the legs are shorter than the body, leg I being slightly longer than the others. The legs are arranged into two groups. The tarsi of the legs each bears a sensilla, two claws and an empodium.

Habitat and locality. One holotype female from an unidentified wild shrub, Grabouw, February 1955.

Ledermülleria lineolata, n.sp.

(Figs. C 14-16)

Ledermülleria lineolata can be differentiated from the other species of this genus by the relatively long dorsal setae. This mite is rotund in shape and is red.

Female (fig. 14)

Dimensions: Length of body (excluding gnathosoma) 416  $\mu$ ; length (including gnathosoma) 600  $\mu$ ; breadth of body 354  $\mu$ .

Dorsum. No distinct suture could be traced between the propodosoma and the hysterosoma. The dorsum is covered with a distinct network, the margins of the elements being relatively thinner than those of L. neomaculata. The dorsum as well as the lateral margins of the body are provided with longitudinal and transverse integumental ridges. The entire dorsum is finely punctated and its eight pairs of long (166  $\mu$ ) linear-lanceolate.....

lanceolate.....

lanceolate setae (fig. 15) are borne on tubercles. These setae are relatively longer than those of L. segnis (Koch), L. maculatus (Schrk.) and L. neomaculata. No eyes could be seen.

Gnathosoma. The palpal tibia bears a strong claw (fig. 16). As in L. maculatus the palpal tarsus is shorter than the claw and bears a prominent tri-partite spine distally. In addition to this spine five setae are also borne on this segment. The chelicerae are normal for the family.

Legs. All the legs are shorter than the body. The tarsus terminates in two claws and a hairy empodium.

Habitat and locality. One holotype female and one paratype female from an unidentified hydrophyte, Duiwelskloof, July 1958. Collected by H. Schoonbee.

Genus VILLERSIA Oudemans, 1927

This genus can be recognised by the palpi which resemble those of the Cheyletidae. It is however not as thick and strong as it is in Cheyllostigmaeus. A tri-partite spine is borne on the palpal tarsus which is shorter than the strong claw. The dorsum is provided with a large propodosomal and hysterosomal plate; two to four plates may also be present.

Villiersia oudemansi, n.sp.

(Figs. C 17-19)

This species can be differentiated from V. vietsi Oudemans by the relatively longer dorsal setae and the presence of four pairs of setae on the dorsal propodosomal plate and five pairs on the hysterosomal plate.

Female (fig. 17)

Dimensions: Length of body (excluding gnathosoma) 374  $\mu$ ; length (including gnathosoma) 470  $\mu$ ; breadth of body 308  $\mu$ . The body is oval-shaped. The colour is red.

Dorsum. The triangular plate on the propodosoma is smaller than that of V. vietsi and is provided with four pairs of setae compared with the three pairs of the latter. The hysterosomal plate also differs from that of V. vietsi in bearing five pairs of setae instead of four. The posterior pair of small plates which are present in V. vietsi could not be observed in the present species; it is probably fused with the large hysterosomal plate. One eye is situated on each side of the propodosoma. All the dorsal setae are linear-lanceolate and relatively longer than those of V. vietsi. The integument is finely striated between the dorsal plates.

Gnathosoma. The palpi (fig. 18) are strong and thick. The penultimate segment of the five-segmented palpus bears a strong claw and a palpal tarsus which is shorter than the claw. The palpal tarsus is provided with a three-pronged spine and four additional setae. The chelicerae have stout bases and sharp needle-like distal portions. The peritreme terminates laterally to the basal portion of the chelicera.

Legs. All the legs are shorter than the body. Two claws and a slender empodium are borne on each tarsus. Tarsi I and II each bear a sensilla.

Male (fig. 19)

Dimensions: Length of body (excluding gnathosoma) 225  $\mu$ ; length (including gnathosoma) 310  $\mu$ ; breadth 178  $\mu$ . The male is smaller than the female and tapers posteriorly. The dorsal aspect is similar to that of the female. In contrast to the female.....

female.....

female, tarsi I and II are each provided with two sensillae, the relative length of which are shown in the figure; tarsi III and IV also bear a relatively long sensilla. The aedeagus is a long, stylet-like curved projection.

Habitat and locality. One holotype female and one allotype male from grass, Potchefstroom, May 1956. Two paratype females and two males from the same locality, May 1958.

Genus MEDIOLATA Canestrini, 1890

The members of this genus can be readily distinguished by the presence of a propodosomal plate and a large hysterosomal plate which may be accompanied by a number of smaller plates. One pair of eyes are present. The palpi are shorter than the first pair of legs. The last segment of the palp surpasses the claw and it is provided terminally, with a tri-partite spine which is flanked by a relatively long and a relatively short seta. Baker & Wharton (1952) consider Zetsellia Oudemans, 1927 as a synonym of this genus.

Mediolata africana, n.sp.

(Figs. C 20-24)

This species is closely related to Mediolata mali (Ewing) from which it differs in the number of the dorsal plates and the relative length of the palpi.

Female (fig. 20)

Dimensions: Length of body (excluding gnathosoma) 355  $\mu$ ; length (including gnathosoma) 461  $\mu$ ; breadth of body 274  $\mu$ ; length of leg I 261  $\mu$ , leg II 200  $\mu$ , leg III 200  $\mu$ , leg IV 233  $\mu$ . The colour varies, some specimens being red while others are yellow. The body is oval-shaped and about twice as long as broad.

Dorsum. The propodosoma is provided with a single triangular plate which bears three pairs of setae, the anterior pair of which are the shortest; in M. mali the third pair of propodosomal setae are placed on two small plates near the posterior corners of the triangular plate. One pair of conspicuous eyes occur on the propodosomal plate. In comparison with M. mali in which the hysterosoma bears one median plate with three pairs of setae and six smaller plates, the hysterosoma of africanus has one large rounded median plate, which is provided with five pairs of setae, and two smaller plates each bearing a seta near the posterior margin of the median plate. As in M. mali a transverse plate, which bears two pairs of setae, ~~is~~ present on the posterior end of the hysterosoma. All the dorsal body setae are linear-lanceolate and sparsely setose. The integument is finely striated between the dorsal plates.

Gnathosoma. The palpi (fig. 21) differ from those of M. mali in their relative lengths; in the latter they reach to about the middle of tarsus I while in this case they only reach to approximately the middle of tibia I. Each palpus is five-segmented; the palpal tibia is provided with a sharp simple claw; the thumb is slender and cylindrical in shape and surpasses the claw by about one-fourth of its length; a prominent three-pronged spine is borne at the tip of the thumb; on the medial side of the spine a long curved simple seta is situated while the lateral side bears a small simple seta; three additional setae occur on the proximal part of the segment. The chelicerae have stout bases which taper towards the slender, sharp, needle-like distal portions. The tips of the chelicerae reach to the distal end of the femur of the palpus. The peritreme terminates laterally to the basal portion of the chelicera.



Legs. The legs are of moderate length; the anterior pair are slightly longer than the rest. Distally, each of the tarsi bears two claws between which a delicate empodium, composed of a slender central pad and six seta-like elements, are situated (fig. 22). Subterminally, tarsus I bears a pair of long, non-duplex setae.

Male (figs. 23-24)

Dimensions: Length (excluding gnathosoma) 288  $\mu$ ; length (including gnathosoma) 430  $\mu$ ; breadth 200  $\mu$ . The male is considerably smaller than the female and is abruptly narrowed posteriorly. Dorsally (fig. 23) the propodosomal plate is provided with the same number of setae as in the female. The large hysterosomal plate bears six pairs of setae, some of which are shorter than those of the female. The aedeagus is sac-like and narrowed to form a long, stylet-like curved projection (fig. 24).

Nympha. Similar to the female.

Habitat and locality. Mediolata africana has a wide distribution and occurs on a large variety of plants. This predacious species was often found associated with spider mites, especially Tetranychus telarius and Oligonychus bicolor. Mediolata mali was reported by Parent & Leroux (1956) to be a predator of the European red mite.

One holotype female, two paratype females and one male from Fragaria vesca, Stellenbosch, January 1955; four females and one male from Pharbitis hispida, Paarl, January 1955; six females and one male from Rubus pinnatus, Stellenbosch; four females and one male from Pelargonium sp., Potchefstroom, April 1955; also five females and one male, Villiersdorp, December 1954; two females, Ceres, February 1955; one female  
and.....

and.....

and one male, Rivier Zonder End, January 1955; one female from Cydonia vulgaris, Caledon, December 1954; four females from Quercus sp., Grabouw, January 1955; one female from Populus canescens, Caledon, December 1954; one female from the same plant species, Ceres, February 1955; ten females and two males from weeds; one female from Solanum tuberosum, Potchefstroom; three females from Eriobotrya japonica, Caledon, December 1954; two females from Vitis sp., Nelspruit, April 1955; one female from Glycine javanica, Nelspruit; eight females and one male from Ficus carica, Grabouw; also one female and three males, Potchefstroom, April 1955; two females and one nymph, Grahamstown, January 1956; two females and one male, Stellenbosch, January 1955; two females from unidentified hedge plants, Cape Town; two females from Ceratonia siliqua, Nelspruit, April 1955; two females from Digitaria diversinervis, Nelspruit; one female from grass, Bathurst, January 1956; one female from Pirus malus, Grahamstown, January 1956; one female and one male from Althaea rosea, Potchefstroom, February 1954.

Genus EUPALOPSIS Canestrini, 1886

The members of this genus can be readily recognised by the palp which is provided with a small claw and a very long, slender palpal tarsus; the dorsum can be divided by one or more transverse sutures and is provided with a number of plates; one pair of eyes are present; the tarsus bears two claws and an empodium which consists of two tenent setae.

Eupalopsis brevipilus, n.sp.

(Figs. C 25-28)

This species is probably closely related to E. pini (Can.),  
E. pinicola.....

*E. pinicola*.....

*E. pinicola* (Berl.) and *E. maseriensis* (Can. & Fanzago). It, however, differs from them in certain features of the palpal tarsus and the relative lengths of the dorsal setae on the posterior end of the body.

Female (fig. 25)

Dimensions: Length of body (excluding gnathosoma) 257  $\mu$ ; length (including gnathosoma) 374  $\mu$ ; breadth of body 151  $\mu$ ; length of leg I 92  $\mu$ , leg II 82  $\mu$ , leg III 80  $\mu$ , leg IV 87  $\mu$ . The body is more or less egg-shaped. Judging from the figure given by Berlese (1882-1903) the body of *E. maseriensis* is relatively longer and narrower than that of *E. brevipilus*.

Dorsum. As in other species of *Eupalopsis* the dorsum is divided into four parts. The propodosoma is provided with a triangular plate which bears four pairs of setae and one eye cornea on each side; the hysterosoma has two plates, each of which bears three pairs of setae. At the posterior end of the hysterosoma a small plate or unstriated area, which is provided with two pairs of setae, is present; these setae are relatively shorter than those of *E. pini* and *E. pinicola*. No reticulations were visible on the dorsal plates. In this respect it differs from *E. pini*, where, according to the figure of Canestrini (1890), the entire dorsum is reticulated. Canestrini figured small discs on the posterior end of the propodosoma but these are not figured by Berlese (1882-1903). In *E. brevipilus* they are absent. The integument between the plates ~~are~~<sup>is</sup> striated. One seta is situated on each side of the striated area between the propodosomal plate and the anterior hysterosomal plate. All the dorsal setae are of moderate length and finely setose.

Gnathosoma. The palpi (fig. 26) are long, slightly longer than the first pair of legs ; the tibia is shorter than the genu and the former bears dorsally a short downwardly curved claw. The palpal tarsus is cylindrical, slender and very long; it is relatively longer than that of E. pini but approximately equal in length to that of E. maseriensis. A prominent straight spine and a small seta, lateral to the spine , are present on the distal end of the palpal tarsus. In this respect it differs from E. maseriensis and E. pinicola which both possess a long, slender seta on the distal end of the palp. The chelicerae (fig. 27) have stout bases which taper towards the slender, sharp distal portions. The peritremes terminate laterally to the basal portions of the chelicerae.

Legs. The legs are of moderate length and are arranged into two groups. Tarsi I-III are each provided with a clavate sensory organ, the one of leg III being the smallest. The segments of the legs are sparsely covered with setae. Each tarsus is distally armed with two claws and an empodium consisting of a single pair of tenent setae.

Male (fig. 28)

Dimensions: Length of body (excluding gnathosoma) 231  $\mu$ ; length (including gnathosoma) 369  $\mu$ ; length of leg I 185  $\mu$ , leg II 128  $\mu$ , leg III 90  $\mu$ , leg IV 98  $\mu$ . The body is smaller but the legs are relatively longer than those of the female. The dorsal plates are similar to those of the female except that they are inconspicuously reticulated. The palpi are similar to those of the female. Tarsi I & II are each provided with two large sensillae and tarsi III & IV each possesses only one.

Although the reticulations on the dorsum of the female could not be observed and the male and female were collected from different localities, they are considered to be conspecific.

Habitat and locality. One holotype female and one paratype female from an unidentified wild shrub, Kaap Muiden, April 1955; one allotype male from an unidentified plant, Munster, April 1955.

Genus APOSTIGMAEUS Grandjean, 1944

The members of this genus have the following characteristics: The integument of the dorsum is striated and only small plates or unstriated areas are present immediately around the bases of the dorsal setae. The tri-partite spine on the tarsus, characteristic of other genera of the Stigmaeidae, is absent and only simple spines and setae occur on its tip. All the tarsi are provided with sensillae or solenidions as <sup>in</sup> the genus Stigmaeus.

Apostigmaeus navicella Grandjean, 1944

(Figs. C 29-33)

Apostigmaeus navicella is the only species yet described in the genus Apostigmaeus.

Female (fig. 29)

Dimensions: Length of body (excluding gnathosoma) 481  $\mu$ ; length (including gnathosoma) 600  $\mu$ ; breadth of body 256  $\mu$ .

As Grandjean suspected, the colour of this species is red. The body is oval-shaped and nearly twice as long as broad.

Dorsum . The integument has fine longitudinal striations except for a small transversely striated area on the posterior surface. The middorsal region of the propodosoma has an inconspicuous reticulated pattern. The areas immediately around the bases of the dorsal setae are not striated and give the impression of small plates. The suture between the propodosoma and hysterosoma is distinct. The propodosoma is provided.....

provided .....

provided with five pairs of dorsal setae, the second pair of which are the longest. Grandjean (1944) could not observe eyes in his specimens from Perigueux (France) and examination of the South African specimens corroborates his findings. The hysterosoma bears nine pairs of setae. All the dorsal setae are short and simple.

Venter. The venter is also provided with fine striations which are mostly longitudinal. The genital opening is slit-like and is contiguous with the anal opening (fig. 30). There are three pairs of genital setae.

Gnathosoma. The palpi are stout, reaching to about the middle of tarsus I. The penultimate segment is provided with a claw; the palpal tarsus is cylindrical and slightly longer than the claw; it bears about five setae. The conical bases of the chelicerae are stout while the movable chela is stylet-like. According to Grandjean the tracheae and stigmata are absent and only a podocephalique canal is present; the canal or peritreme was also found in the specimens examined; it ends laterally to the basal portion of the chelicera.

Legs. The legs are short and arranged into two groups. The tarsi (fig. 31) of all the legs each bears a sensilla or solenidion, those of tarsus III and IV being much shorter than those of tarsus I and II; that of tarsus I is the longest. Each tarsus bears two claws and a group of capitate tenent setae.

Male (fig. 32).

Dimensions: Length of body 373 $\mu$ ; breadth of body 205 $\mu$ . Postero-dorsally the male differs from the female by the presence of two short stout and one long slender setae situated on tubercles on each side of the genito-anal opening. It also differs.....

differs.....

differs by the absence of the pair of setae marked lr in fig. 29 (compare fig. 1A Grandjean, 1944) and by the presence of a second large sensilla or solenidion on tarsus I. Tarsus II-IV are also each provided with two sensillae of which the proximal one is the longest. The aedeagus (fig. 33) is complicated but looks more or less like a pear-shaped sac with a stylet-like projection.

Habitat and locality. One female and one male from decaying organic material from a hole in a willow tree, Potchefstroom, May 1956; many specimens were also found in decaying organic material between grass, Potchefstroom, April 1958.

FAMILY RAPHIGNATHIDAE KRAMER, 1877

When Oudemans (1931) created the family Stigmaeidae he restricted the Raphignathidae to the few genera which possess tetranychid-like peritrenes. Baker & Wharton (1952) included the families Stigmaeidae and Caligonellidae in the Raphignathidae. Since then, however, other authors like Cunliffe (1955) and Summers & Schlinger (1955) regarded them as constituting separate families, a viewpoint with which the present author is in full agreement.

Key to the South African genera and species of the family Raphignathidae

- 1. Antero-median plate widely separated from postero-median plate.....Acheles Oudemans.
  - a. Antero-median plate narrowing towards its anterior end; lateral and antero-median plates striated longitudinally and postero-median plate striated transversely; length of body (excluding gnathosoma)

443, u; .....

443  $\mu$ .....

443  $\mu$ ; length (including gnathosoma) 584  $\mu$ ;

breadth 339  $\mu$ .....A. aethiopica, n.sp.

--. Antero-median plate not widely separated from postero-median plate.....Raphignathus Dugés.

a. Small plates near the posterior margins of the propodosomal plates absent; members of the first pair of hysterosomal setae situated nearer to the middle line than those of the second pair.....R. bathursti, n.sp.

Genus RAPHIGNATHUS Dugés, 1834

The following are the characteristics by which the members of this genus can be identified: The coxae are contiguous. The propodosoma is provided with three plates placed closely together. One pair of eyes are present on the propodosoma. The hysterosoma has a single plate. The penultimate segment of the palpus is provided with a very small claw. The palpal tarsus is much longer than the claw. Tarsus I is provided with a clavate sensory organ.

The genus Syncaligus which was created by Berlese (1910) is considered a synonym of this genus (Baker & Wharton, 1952).

Raphignathus bathursti, n.sp.

(Figs. C 34-36)

This species is near Raphignathus cardinalis Ewing. It can be distinguished from the latter by the absence of the small plates which are situated near the posterior margins of the propodosomal plates of R. cardinalis. These two species also differ in the arrangement of the dorsal setae on the hysterosoma.



Female (fig. 31)

Dimensions: Length of body 340  $\mu$ ; breadth of body 248  $\mu$ ; length of leg I 240  $\mu$ , leg II 170  $\mu$ , leg III 185  $\mu$ , leg IV 230  $\mu$ . The body is egg-shaped.

Dorsum. As in R. cardinalis the propodosoma is covered by three plates which are minutely punctated. The integument between these plates and the hysterosomal plate is striated. The median propodosomal plate bears three pairs of dorsal setae and each of the lateral plates bears three setae and an eye cornea. A broad minutely punctated plate covers the whole hysterosoma and bears five pairs of setae. Compared with R. cardinalis, in which the members of the first pair of hysterosomal setae are widely separated, these setae are placed nearer to each other. The second pair of hysterosomal setae are more widely spaced than those in R. cardinalis. One seta occurs on each side of the terminal anal opening. The dorsal setae are linear-lanceolate and are set on small tubercles.

Venter. The genital opening is slit-like and three setae are present on each side. The anal and the genital openings are not contiguous.

Gnathosoma. The palpi reach to the middle of tarsus I. The penultimate segment of the five-segmented palp is provided with a short claw. The palpal thumb is much longer than the claw and is provided with eight setae, four of which are stout and occur at its tip. The mandibular plate and stylets resemble those of the Tetranychidae. The peritrenes enter into the basal portions of the fused chelicerae.

Legs. The legs are short with contiguous coxae. Tarsi I-II are each provided with a clavate sensory organ and apically with a pair of non-duplex setae. The tarsi each bear two claws and an empodium which is pad-like and is provided with ten setae.

Habitat and locality. One holotype female and two paratype females from soil and grass, Bathurst, January 1956. Collected by P. Graham.

Genus ACHELES Oudemans, 1903

The distinctive characters of this genus are the following: In the female the dorsum is anteriorly provided with two lateral and one antero-median plate and posteriorly with a postero-median plate which is widely separated from the antero-median plate. According to the description of the type of the genus, A. mirabilis, given by Oudemans (1903) the male is provided with only two dorsal plates. A supra-anal plate is also present.

Acheles aethiopica, n.sp.

(Figs. C 37-39)

The differences between this species and Acheles mirabilis Oudemans the only other known species, are small. The antero-median plate of A. aethiopica narrow anteriorly while that of A. mirabilis is rounded in front. The shape of the postero-median plate of the former also differs from that of the latter.

Female (fig. 37)

Dimensions: Length of body (excluding gnathosoma) 443  $\mu$ ; length (including gnathosoma) 584  $\mu$ ; breadth of body 339  $\mu$ . The body is oval-shaped.

Dorsum. The striated dorsum is provided with four plates or areas in which the striations are differentiated. These "plates" were only discernable under the phase-contrast microscope. The two lateral plates each bear three setae and one eye and ~~is~~ provided with longitudinal striations.

The.....

The.....

The longitudinally striated antero-median plate bears three pairs of setae. The postero-median plate also carries three pairs of setae but the striations are mostly transverse. Judging from an unpublished drawing made by Oudemans of A. mirabilis the antero-median plate of this species is narrower than that of the ~~former~~<sup>former</sup> and the postero-median plate differs slightly in shape. According to this drawing by Oudemans the dorsal plates of A. mirabilis are not striated. Anteriorly, the interscutal membrane has longitudinal and posteriorly transverse striations; it is provided with three pairs of setae. As in A. mirabilis the supra-anal plate is provided with two pairs of setae.

Venter. The slit-like genital opening (fig. 38) and the anal opening are not contiguous. Three setae are present on each side of the genital opening.

Gnathosoma. The penultimate segment of the palpus (fig. 39) is provided with a short claw. As in A. mirabilis the palpal tarsus is much longer than the claw and is provided with four stout setae at its tip. Judging from the drawing by Oudemans the palpal tarsus of A. mirabilis appears to be longer than that of the present species. The chelicerae are fused medially; the movable chelae are stylet-like. The peritremes enter into the basal portions of the chelicerae.

Legs. The legs are shorter than the body; legs I and IV are the longest. Tarsi I-III are each provided with a clavate sense organ, the one on leg III being the smaller. The tarsus is provided with two claws and an empodium which is pad-like and provided with a number of setae.

Habitat and locality. One holotype female and one paratype female from grass and soil, Bathurst, January 1956. Collected by P. Graham.

## FAMILY CRYPTOGNATHIDAE OUDEMANS, 1902

These mites are probably predacious and exhibit the following characteristics: The gnathosoma is enclosed in a sheath formed by the extension of the body wall; the suture between the propodosoma and hysterosoma is absent; the whole dorsum may be reticulated or it may be reticulated laterally and punctated medially; the chelicerae are elongated and are provided with small untoothed chelae which are sharp for piercing; the genital suckers are absent.

In this family one genus only, comprising two species and one subspecies is known.

## Genus CRYPTOGNATHUS Kramer, 1878

The members of this genus can be recognised by the family characteristics mentioned above.

Cryptognathus cucurbita cucurbitella, n.subsp.

(Fig. C 40)

Berlese (1916) described C. cucurbita cucurbita and C. cucurbita var. subnitida. This new subspecies exhibits the diagnostic characteristics of C. cucurbita namely the lateral reticulated area, the median punctated area on the dorsum and the swollen appearance of the majority of the leg segments. It, however, differs from the two subspecies of cucurbita in the arrangement of the dorsal setae. According to Berlese C. cucurbita var. subnitida approach C. lagena by the presence of more reticulations on the dorsum and the rather indistinct punctations. On these grounds C. cucurbita var. subnitida was separated from C. cucurbita and this can also be applied to the new subspecies.

Cryptognathus cucurbita can now be split into three  
subspecies.....

subspecies.....

subspecies namely C. cucurbita cucurbita, C. cucurbita subnitida and C. cucurbita cucurbitella and they can be separated from each other by the above-mentioned characteristics.

Dimensions: Length of body (excluding gnathosoma) 269  $\mu$ ; length (including gnathosoma) 392  $\mu$ ; breadth of body 190  $\mu$ . The body is oval-shaped.

Dorsum. The suture between the propodosoma and hysterosoma is absent. As in C. cucurbita cucurbita the integument is reticulated laterally and punctated medially. A pair of eyes are located on each side of the propodosoma. The propodosoma bears two pairs of setae in front and two pairs behind each eye pair. C. cucurbita cucurbita possesses three pairs anterior to and one pair posterior to the eyes. The hysterosoma bears six pairs of setae. Judging from the figure by Baker & Wharton (1952) the fourth and fifth hysterosomal setae of the present subspecies are situated further from each other than they are in C. cucurbita cucurbita. All the dorsal setae are simple and borne on small tubercles.

Gnathosoma. The gnathosoma is partially enclosed by the reticulated tube formed by the chitinous extensions of the body. The chelae of the shear-like chelicerae are small, almost straight, untoothed and sharp for piercing.

Legs. As in C. cucurbita cucurbita some of the segments of the legs are swollen. The legs are sparsely covered with setae. The coxae are contiguous. All the tarsi are provided with two claws and an empodium. Tarsus I and II each bear a sensory spine.

Habitat and locality. The holotype was collected from grass and soil, Bathurst, January 1956, by P. Graham. The sex could not be determined.

SUPERFAMILY CHEYLETOIDEA CUNLIFFE, 1955

Many of the members of this superfamily possess the palpal thumb-claw complex; the movable chela is straight, stylet-like and varies in length; the basal portions of the chelicerae are fused with the gnathosoma so that they are not visible as in other groups. The families which have no palpal thumb-claw complex are a little more specialized, morphologically and biologically, than the Cheyletidae; they can be recognised by the structure of the gnathosoma, the tarsal claws and empodia and the position of the aedeagus.

This superfamily comprises the following families: Cheyletidae Leach, 1815; Myobiidae Megnin, 1877; Demodicidae Nicolet, 1855; Heterocheylidae Trägårdh, 1950.

FAMILY CHEYLETIDAE LEACH, 1815

The Cheyletidae are prostigmatic mites which have short stylet-like chelicerae and large pincer-like palpi. A short palpal tarsus is located on the posterior part of the palpal tibia and in most cases it bears comb-like and sickle-like setae; the palpal tibia is provided with a strong claw which extends beyond the palpal tarsus. The propodosoma and the hysterosoma are usually plainly delineated and usually provided with one or more dorsal plates. The dorsal body setae are simple, serrate, rodlike or clavate. These mites are usually free-living predators.

Genus CHEYLETIA Haller, 1884

The species of this genus have the following distinctive characteristics; The palpal tarsus is provided with two simple sicklelike and two comb-like setae; the palpal claw bears basal teeth; the dorsum is provided with two plates;

a.....

a.....

a pair of eyes ~~are~~<sup>is</sup> situated on each side of the propodosomal plate; the dorsal setae are squamiform; leg I is normal and provided with two claws.

Key to the South African genera and species of the family  
Cheyletidae associated with plants.

1. Leg I normal, with two claws; dorsal body setae  
squamiform.....Cheyletia Haller.

a. Palpal claw with seven to eight teeth; inner  
palpal femoral seta squamiform; dorsomedian setae  
of body appear staghornlike or squamiform.....  
.....C. wellsi Baker.

---. Leg I a sensory organ, without claws; tarsus I attenuate  
at tip, with an empodium; dorsal body setae rod-like and  
serrate.....Cheletomorpha Oudemans.

a. Palpal claw in the male with two to three small  
teeth and in the female with a single basal  
tooth; submedian setae of the female simple and  
that of the male short and spatulate; claws absent;  
tarsus I with an empodium.....C. lepidopterorum  
(Shaw)

Cheyletia wellsi Baker, 1949

(Figs. D 1-2)

Cheletia wellsi can be identified by the number of the palpal  
claw teeth and the type of the setae. These mites are small and  
orange coloured.

Female (fig. 1)

Dimensions: Length of body (excluding gnathosoma) 300  $\mu$ ;  
length,.....

length.....

length (including gnathosoma) 445  $\mu$ ; breadth of body 240  $\mu$ .

Dorsum. The punctated propodosomal plate is trapezoid-like and have rounded corners. In the middle portion it is irregularly striated. In the South African specimens examined it bears four pairs squamiform serrate marginal and four to five pairs of dorso-medial staghornlike setae. A single pair of eyes are present on the edge of the plate. The hysterosomal plate is punctated and narrows towards the rear; its corners are broadly rounded. It bears four pairs of squamiform serrate marginal setae and two pairs of dorso-submedian staghorn-like setae; a single pair of squamiform serrate setae are situated near to both the anterior and posterior corners of the plate. The integument between the plates are striated and punctated.

Gnathosoma. The palpi (fig.2) are short and thick; the palpal femur is swollen and broader than long; it is provided with small dorsal tubercles and a squamiform dorsal seta. The genu has a similar seta on its posterior margin; the penultimate segment bears a strong claw which in the South African specimens is provided with seven teeth. The outer comb-like seta of the palpal tarsus is about as long as the claw and it bears approximately fifteen teeth; the inner comb on the other hand is short and bears about 20 teeth. Two simple setae also occur on the palpal tarsus. The rostrum is covered by a tuberculated plate.

Legs. The legs are short; leg I is the longest. Tarsus I is provided with two long sensory setae near its distal end; two shorter setae are situated more proximally; tibia I has a large dorsal squamiform serrate seta and a small clavate sense organ. Each tarsus is provided with two claws and an empodium.



Habitat and distribution. This species has a wide distribution but has not previously been recorded from South Africa. One female from Citrus limonia, Munster, April 1954; specimens were also found on decaying organic material between grass, Potchefstroom, April 1958. The specimen from Citrus limonia has only four pairs of staghorn-like setae on the propodosoma whereas the specimens from the grass possess five pairs as in the type species.

Genus CHELETOMORPHA Oudemans, 1904

The members of this genus can readily be distinguished on account of the following: Tarsus I is attenuate at the tip and devoid of claws but provided with an empodium; leg I is used as a sensory organ; one lens-like eye is present on each side of the body; the palpal tarsus is provided with two simple sickle-like and two comb-like setae.

Cheletonomorpha lepidopterorum (Shaw), 1794

(Figs. D 3-5)

Originally described under the name Acarus lepidopterorum. Several synonyms such as Cheletonomorpha venustissimus (Koch), Cheyletus seminivorus Packard, C. longipes Megnin and C. rufus Hardy exist.

Male (fig. 3)

Dimensions: Length of body (excluding gnathosoma) 310  $\mu$ ; length (including gnathosoma) 500  $\mu$ ; breadth of body 270  $\mu$ ; length of leg I 670  $\mu$ , leg II 374  $\mu$ , leg III 410  $\mu$ , leg IV 420  $\mu$ . This is a long-legged mite with an oval-shaped body.

Dorsum. The propodosomal plate bears three pairs of long serrate rod-like marginal setae near the eye and one pair near the posterior corner of the plate; the two pairs of submedian setae.....

setae.....

setae are short, spatulate and serrate; a pair of long serrate rod-like scapular setae are also present.

The hysterosomal plate is provided with three pairs of lateral marginal setae which are long, serrate and rod-like; the three pairs of submedian setae and the one pair of setae on the posterior margin of the body are short, spatulate and serrate.

Gnathosoma. The palpal femur is strongly swollen externally and straight internally (fig. 4); it is provided with three long, rod-like serrate setae; the palpal claw is long and slender and is provided with three small teeth. The short palpal tarsus bears an outer comb, which is about as long as the claw, an inner comb and two long simple setae; both the outer and the inner combs are provided with teeth. The rostrum is long and narrow and its sides are concave. The peritreme is simple and consists of small segments.

Legs. All the legs are longer than the body. The legs are provided with relatively long serrate rod-like setae. Tarsus I is devoid of claws but it is provided with an empodium (fig. 5).

Female. According to Baker (1949) the female is similar to the male except for its palpal claw which bears a single basal tooth; body setae are shorter than in the male; the dorsal submedian setae are short and simple.

Habitat and distribution. This cosmopolitan mite is one of the most striking species of the cheletids. Lawrence (1954) recorded this mite from citrus, Letaba, Eastern Transvaal. One male from Ananas sativus, Grahamstown.

SUPERFAMILY ANYSTOIDEA CUNLIFFE, 1955

The thumb-claw complex is distinctive of this superfamily. The chelicerae are hinged posteriorly so that they are free to move laterally; the movable chelae are small and not opposed to the remnants of the fixed chelae. The other characteristics are variable and are used to separate the following families: Anystidae Oudemans, 1902; Pseudocheylidae Oudemans, 1909, Teneriffiidae Thor, 1911 and Pterygosonidae Oudemans, 1910.

FAMILY ANYSTIDAE OUDEMANS, 1902

These are long-legged, fast moving predacious mites with radiating legs. They have a soft striated integument and may also have a propodosomal plate which, rather than being sclerotised may represent an area which either lacks striations or exhibits them in a differentiated condition. The suture between the propodosoma and the hysterosoma is absent. A movable hook-like chela which is terminally situated is present. The palpal tarsus is situated disto-ventrally on the tibia which is provided with three claws. The epivertex is a small plate located anteriorly on the propodosoma and bears a pair of pseudostigmatic organs. The tarsi each have two claws which may be combed, toothed, or pilose and ~~are~~ provided with a claw-like, brush-like or bell-like empodium. The genital suckers are absent.

This family can be divided into two subfamilies.

Key to the South African genera and species of the family

Anystidae

1. Short, broad, with two pairs of eyes; palpal tibia with three claws..... Subfamily Anystinae

Anteriorly propodosomal plate hexagonal with a posterior indentation; broader than long; two small

plates,.....

plates.....

plates, each with a seta, near the posterior half of the genital opening.....Anystis Von Heyden.

- a. Body square or trapezoidal; propodosomal plate (75  $\mu$  long, 240  $\mu$  broad) rounded in front; posterior margin conspicuously indented; length of body (excluding gnathosoma) 1094  $\mu$ ; length (including gnathosoma) 1263  $\mu$ ; breadth of body 964  $\mu$ .....
- .....A. baccarum (Linn.)

- . Longer than broad; with one to two pairs of eyes; palpal tibia with one smooth claw or two feathered claws.....
- .....(Subfamily Erythracarinae).....2

- 2. Dorsum with numerous setae; propodosomal plate fairly large and with setae on or near its margin; tarsi with false articulations; coxae close together.....Anandia Hirst.

- a. Relatively large triangular propodosomal plate with fourteen pairs of setae on or near its margins; length of body (excluding gnathosoma) 1297  $\mu$ ; length (including gnathosoma) 1641  $\mu$ ; breadth of body 667  $\mu$ .....A. bathursti, n.sp.

- . Dorsum with ten to twelve pairs of setae; propodosomal plate (when present) not very large and with few setae.....3

- 3. Propodosomal plate absent; peritremata directed posteriorly; chelicera with one distal seta; coxae in two slightly separated groups.....Bechsteinia Oudemans.

- a. Integumental striations forming three diamondshaped figures.....


figures.....

figures in the median region of the hysterosoma;

length of body (excluding gnathosoma) 974  $\mu$ ;

length (including gnathosoma) 1223  $\mu$ ; breadth of body

600  $\mu$ .....B. grahani, n.sp.

--. Propodosomal plate present; peritremata  shaped; chelicera with two setae; coxae touching along median line; four pairs of lentiform organs are present.....

.....Chaussieria Oudemans

a. Propodosomal plate pentagonal; palpal tarsus shorter than the remainder of palp; length of body (excluding gnathosoma) 1018  $\mu$ ; length (including gnathosoma) 1536  $\mu$ ; breadth 673  $\mu$ .....

.....C. capensis, n.sp.

SUBFAMILY ANYSTINAE OUDEMANS, 1936

The members of this subfamily can readily be recognised by the palpal tibia which is provided with three claws; two pairs of eyes are present; the body is short and broad.

Genus ANYSTIS Von Heyden, 1826

Oudemans (1936) considered Actineda Koch, 1836 as synonymous with Anystis and diagnosed the latter by means of the following characteristics: Anteriorly the propodosomal plate is more or less hexagonal and posteriorly it is impressed; it is broader than long. Two small plates, each provided with a seta, are situated near the posterior half of the genital opening.

Anystis baccarum (Linn.) 1758

(Fig. E 1-5)

Anystis baccarum is a reddish mite with a characteristic

square.....

square.....

square or trapezoidal shape.

Female (fig. 1)

Dimensions: Length of body (excluding gnathosoma) 1094  $\mu$ ; length (including gnathosoma) 1263  $\mu$ ; breadth of body 964  $\mu$ .

Dorsum. The suture between the propodosoma and hysterosoma is absent. Anteriorly the propodosoma bears a small rounded plate (epivertex) which is provided with two pseudostigmatic organs. The peritreme is located at the base of the chelicerae. The propodosoma is provided with a plate (striations absent or differentiated). The plate is rounded in front and is 75  $\mu$  long and 240  $\mu$  broad; its posterior margin is indented. It bears three pairs of setae; the anterior pair are slightly shorter and thinner than the other pairs. Two eyes are present on each side of the body.

Medially, the striations on the hysterosoma are arranged in the form of a V. The hysterosoma bears seven pairs of setae. All the dorsal setae are finely setose (fig 2).

Venter. The genital opening (fig. 3) is flanked by six setae.

Gnathosoma. The palpal tibia is provided with three claws (fig. 4). The palpal tarsus bears about fourteen strong setae and a short spire. The chelicerae are broad basally and gradually narrow to their distal ends. The distally situated movable chela is hooklike.

Legs. The legs radiate from the body and the coxae are grouped together. All the legs are richly covered with setae. The tarsi are each provided with combed claws and a bell-like empodium (fig. 5). Two brush-like setae are situated at the base of the claw.

Habitat and locality. Anystis baccarum is commonly found in Europe and Australia. According to Womersley (1933) it is common in the country side around Cape Town. It is predacious on other mites and many small insects.

Specimens were collected from Pelargonium sp., Nelspruit, April 1955; Carica papaya, Nelspruit, April 1955; wild legume, Grabouw; unidentified wild shrub, Pretoria, January 1956; Lilium longiflorum, Potchefstroom, October 1955; Pirus communis, Buxton, January 1956; Musa sapientum, Munster, April 1955; soil and grass, Bathurst, June 1956; Protea sp., Western Province.

SUBFAMILY ERYTHRACARINAE OUDEMANS, 1936

This subfamily can be identified by the following characteristics: The body is longer than broad and may be provided with one or two pairs of eyes. The palpal tibia bears either one smooth or two feathered claws.

Genus ANANDIA Hirst, 1927

This genus exhibits the following diagnostic characteristics: The propodosoma has a fairly large plate which is provided with a number of setae on or near its margin. Two pairs of eyes are present on each side of the body; the tarsi of the legs are provided with many false articulations and three claws, which have stout combs on each side, resembling those of the Teneriffiolidae. The coxae lie close together.

Anandia bathursti, n.sp.

(Figs. E 6-8)

This species differs from A. alticola Hirst, the only other known species in this genus, by the presence of a

smaller.....

smaller.....

smaller triangular dorsal plate; its margin is also provided with fewer setae than that of the ~~former~~<sup>latter</sup>. The palpal tarsus appears relatively shorter than that of A. alticola.

Dimensions: Length of body (excluding gnathosoma) 1297  $\mu$ ; length (including gnathosoma) 1641  $\mu$ ; breadth of body 667  $\mu$ . The body is oval-shaped.

Dorsum (fig. 6). The epivertex bears two slender pseudostigmatic organs. Anteriorly the propodosoma is also provided with a relatively large, more or less triangular, plate which bears about fourteen pairs of setae on or near its margin. Two of these, near the anterior margin, represent a pair of slender pseudostigmatic setae. In A. alticola the plate is relatively large and not triangular in shape whereas the setae on its margin are more abundant. Two eyes are situated on each side of the dorsal plate. The interscutal membrane of the dorsum bears seventeen pairs of setae. All the dorsal setae are setose.

Venter. Owing to injury and distortion the genital opening could not be observed.

Gnathosoma. As in A. alticola the penultimate segment of the palp (fig. 7) bears two strong claws, the distal one being larger and provided with a double row of teeth. The palpal tarsus is relatively shorter than that of A. alticola but as in the latter species it also bears a claw-like spur. In addition to the spur the palpal tarsus is also provided with a number of setose setae. The chelicerae are like those of other anystids.

Legs. The fourth pair of legs are the longest and slightly longer than the body; the others are shorter than the body.

All.....



All.....

All the legs are densely covered with setose setae. The tarsi (fig. 8) are provided with false articulations and distally bear three claws which are provided with stout combs. The proximal segment of tarsi I and II each bears two small sensory spines. Ventrally the coxae are all grouped together and provided with numerous setae.

Habitat and locality. One holotype specimen from soil and grass, Bathurst, January 1956. Collected by P. Graham.

Genus BECHSTEINIA Oudemans, 1936

The mites belonging to this genus can be recognised by the absence of a dorsal plate. The peritremes which are located at the base of the chelicerae, are directed posteriorly. The chelicerae are each provided with one distal seta. The coxae are arranged in two slightly separated groups.

Bechsteinia grahami, n.sp.

(Figs. E 9-12)

This species is longer than B. schneideri Oudemans 1936 and can also be separated from the latter by means of the integumental pattern on the dorsum.

Female (fig. 9)

Dimensions: Length of body (excluding gnathosoma) 974  $\mu$ ; length (including gnathosoma) 1223  $\mu$ ; breadth of body 600  $\mu$ . The body is egg-shaped.

Dorsum. The epivertex carries a pair of pseudostigmatic organs. The dorsum is provided with ten pairs of finely setose setae. The two eyes on each side of the body are more widely separated.....

separated.....

separated than those of B. schneideri. The integument is finely striated. The pattern formed by the striations differs from that figured by Oudemans for B. schneideri. Three diamond-shaped figures are formed in the median region of the hysterosoma; these are absent in B. schneideri.

Venter. The genital plate is oval-shaped and is provided with many setose setae (fig. 10); in schneideri the plate has a more rectangular shape and bears fewer setae.

Gnathosoma. The palpal tibia is provided with two strong claws, the secondary comb-like claw being the shortest (fig. 11). The palpal tarsus measures 128  $\mu$  and is thickly covered with setose setae. The division between the palp femur and palp genu is incomplete.

In contrast to B. schneideri in which, according to Oudemans' description and figure, the chelicerae are shorter than the femuro-genu, they are longer in the present species. Each chelicera is provided with one short distal seta only. The peritremes are normal for the genus.

Legs. The legs are long and thickly covered with strong setose setae. The false articulations of the tarsi are inconspicuous. Each tarsus is provided with two claws and a haired empodium (fig. 12). Ventrally the coxae are grouped into two slightly separated groups.


Habitat and locality. One holotype female and two paratype females from grass and soil, Bathurst, January 1956. Collected by P. Graham.

Genus CHAUSSIERIA Oudemans, 1937

In his revision of the family Anystidae Oudemans (1936) created the genus Schellenbergia with Erythraeus domesticus Koch.....

Koch.....

Koch, 1847 as the type. The name Schellenbergia was changed to Chaussieria in 1937 by the same author because the former name was pre-occupied.

This genus can be identified by the following characteristics: The dorsal plate is broader than long. The dorsal setae arise from plate-like structures. Two eyes and four lentiform organs are present on each side. The peritremata are  shaped. The chelicera bears two setae. The epivertex is provided with a small terminal projection. The basi- and telofemurs of all the legs are fused. The tarsus is shorter than the tibia and subdivided into a long basitarsus and a shorter telotarsus. The coxae almost touch each other along the median line.

Chaussieria capensis, n.sp.

(Figs. E 13-16)

This species can be differentiated from the other species of this genus by the shape of the dorsal plate and the relatively short palpal tarsus.

Female (fig 13)

Dimensions: Length of body (excluding gnathosoma) 1018  $\mu$ ; length (including gnathosoma) 1536  $\mu$ ; breadth of body 673  $\mu$ . The body is more or less oval-shaped.

Dorsum. The body extends anteriorly to form a small plate or epivertex bearing a pair of pseudostigmatic organs. The epivertex is provided with a small terminal projection. The dorsal plate is shaped as figured in fig. 13. In this respect it differs from C. maritima Evans & Browning and C. domesticus (Koch). This plate is broader than long and bears three pairs of relatively long, finely setose setae. One eye is situated on each side of the lateral corner of the plate. The remainder

of.....

of.....

of the dorsum is finely striated and provided with eight pairs of setose setae arising from plate-like structures. The setae become progressively shorter towards the posterior end of the body. Four pairs of lentiform organs are present on each side of the dorsum.

Venter. The genital plate (fig. 14) is long and narrow and provided with two longitudinal rows of setose setae. The external row nearly reaches to the middle of the plate whereas the internal row covers the entire distance. As in C. venustissimus, figured by Berlese (1882), a row of about ten to twelve setose setae are present on each side postero-laterally to the genital plate. In his description and figure Berlese has shown that these setae are only setose distally but in C. capensis they are entirely setose. A row<sup>of</sup> more widely spaced setose setae are present on the antero-lateral sides of the genital plate.

Gnathosoma. The palp (fig. 15) is strong and in contrast to C. maritima, C. berlesei (Oudemans) and C. flavus (Dug.) it is provided with a tarsus which is shorter than the remainder of the palp. It measures 147 $\mu$  and is thickly covered with setae, the terminal ones being the longest. In this case the terminal setae are longer than those figured for C. venustissimus but shorter than those of C. maritima. The three longest terminal setae each measures 157 $\mu$ . The division between the femur and the genu of the palp is incomplete. The palpal tibia bears two strong comb-like claws, the secondary one being the shorter. The chelicerae are each provided with two setae; the proximal one is long and setose while the distal one is short and smooth. The peritreme is normal for the genus.

Legs. All the legs are longer than the body and thickly covered with strong setose setae. The tarsus (fig. 16) terminates in two claws and an empodium. Ventrally the coxae are cylindrical and almost meet each other in the middle line.

Habitat and locality. One holotype female from grass and soil, Bathurst, January 1956. Collected by P. Graham; three paratype females from clover and lucerne, Caledon, July 1955; one paratype female from oats and lucerne, Graaff-Reinet, July 1958, collected by H.B. McNaughton.

#### FAMILY PSEUDOCHEYLIDAE OUDEMANS, 1909

These are elongated and somewhat rhombic mites. A strong groove separates the propodosoma from the hysterosoma. A weak propodosomal plate may be present but usually it is entirely absent. The propodosoma bears two pairs of sensory setae. The genus Heterocheylus has only one pair of propodosomal sensory setae. The palpal femur is longer than the other segments and is thickened on the outer side with the result that the palpi are forceps-like. The palpal tibia is provided with a strong claw, and the ventral palpal tarsus may be weak. In the genera Pseudocheylus and Neocheylus the tarsi of the legs are provided either with a long stalked triangular caruncle or a sucker; claws are absent. In Tarsocheylus a bell-like caruncle or lobe is present between two claws or in the case of Stigmocheylus the empodium is absent and ~~has~~ normal, but very small claws on tarsi I and comb-like claws on the other tarsi. Tarsi I lack ambulacra but II, III and IV have either caruncles or only lobes. The genital suckers are absent. These mites appear to be predacious. Trägårdh (1950) divided this family into two subfamilies namely the Pseudocheylinae and Heterocheylinae.

SUBFAMILY PSEUDOCHEYLINAE TRAGARDH, 1950

The members of this subfamily possess stylet-like chelicerae; the palpi are each provided with a large, sharply pointed, dentate terminal tooth and a varying number of comb-shaped or sickle-shaped setae. All the legs bear claws.

Genus NEOCHEYLUS Trägärth, 1906

This genus is characterised by the following: The palp resembles that of Cheyletus; two pairs of pigment spots with a mutual cornea are present on each side of the propodosoma; the tarsi are without claws but each provided with a long stalked triangular caruncle.

Neocheylus natalensis Trägärth, 1906

Neocheylus natalensis has the following characteristics: The colour is red. The body is elongated. A suture is present behind the second pair of legs. The body setae and the setae of the legs are simple. Medially the palpal tarsus is provided with ten to twelve long setae. The palpi project beyond the chelicerae. According to Trägärth (1906) the length (including gnathosoma) is 850  $\mu$ ; length of gnathosoma 170  $\mu$ ; breadth 330  $\mu$ .

Trägärth described this species from fresh water moss, Natal.

SUBCOHORS EUPODOSTIGMATA CUNLIFFE, 1955

The members of this group are provided with an internal tracheal system but the external peritremes are absent. The tarsus of the palp is terminal and the thumb-claw complex is absent.

SUPERFAMILY EUPODOIDEA BANKS, 1894

The anterior portion of the propodosoma of these prostigmatic mites is provided with a small plate or epivertex which bears a pair of setae. The chelicerae are simple, opposed, or partially chelate for piercing; the palpi are simple; the tarsi are provided with striated sensory setae, lying flat rather than erect, in a special membraneous area (the rhagidial organs); the tarsal claws are simple and rayed; the empodium is padlike and rayed laterally.

This superfamily comprises the following families: Eupodidae Koch, 1842, Penthaleodidae Thor, 1933 and Rhagidiidae Oudemans, 1922.

FAMILY EUPODIDAE KOCH, 1842

The genera Falotydeus and Penthaleus were formerly placed in the family Penthaleidae but Baker & Wharton (1952) consider Penthaleidae as a synonym of Eupodidae because the former family does not represent a clearly defined group.

The members of this family are soft-bodied and have no projection over the rostrum. They possess two pairs of genital suckers. The tarsi bear two claws and a hairy empodium. A pair of weakly differentiated sensory setae are present. The chelicerae are shearlike.

Key to the South African genera and species of the family

Eupodidae

1. Fourth pair of legs thickened; suture between propodosoma and hysterosoma usually conspicuous; epivertex provided with two short simple setae.....Eupodes Koch
- a. Suture between propodosoma and hysterosoma present.....b
- . Suture absent; scapular setae 88  $\mu$ ; two pairs of median hysterosomal setae 80  $\mu$ ; spindle-shaped setae near posterior margin of body 115  $\mu$ ; length of body (excluding gnathosoma) 380  $\mu$ ; length (including gnathosoma) 470  $\mu$ ; breadth 201  $\mu$ ; length of leg I 614  $\mu$ .....E. fusiferella, n.sp.
- b. First pair of legs longer than the body; dorsal setae not spindle-shaped.....c
- . First pair of legs shorter than the body; dorsal setae, except the four pairs of posterior setae, spindle-shaped; length of body (excluding gnathosoma) 455  $\mu$ ; length (including gnathosoma) 530  $\mu$ ; breadth 258  $\mu$ .....E. parafusifer, n.sp.
- c. Dorsal setae of moderate length and finely setose; length of body (excluding gnathosoma) 371  $\mu$ ; length (including gnathosoma) 423  $\mu$ ; breadth 209  $\mu$ .....E. variegatus Koch
- . Dorsal setae extraordinary long and setose; length 600-640  $\mu$ ; breadth 415-430  $\mu$ .....E. longipilus Thor
- . Fourth pair of legs not thickened or slightly thickened; suture usually absent.....2



2. First pair of legs up to four times (often six times) as long as the body; fourth pair of legs slightly thickened; anus ventral.....Linopodes Koch
- a. First pair of legs nearly four times as long as the body; length of body (excluding gnathosoma) 420  $\mu$ ; length (including gnathosoma) 598  $\mu$ ; breadth 308  $\mu$ .....L. motatorius africanus, n.subsp.
- . First pair of legs not extraordinary long; fourth pair of legs not thickened; anus terminal or dorsal.....3
3. Anus terminal.....Halotydeus Berl.
- a. Colour black; second and third segments of palpus relatively long; first pair of legs slightly longer than the body.....H. destructor (Tucker)
- . Anus dorsal.....Penthaleus Koch
- a. Fourth palpal segment shorter than the third and with five to six short setae; chelicerae long and thick, chelae strong; fixed digit with finger-like projections; length 1000  $\mu$ ; breadth 600-700  $\mu$ .....P. major (Dugés)

Genus EUPODES Koch, 1842

The distinctive characteristics of this genus are the following: Dorsally, the propodosoma is provided with a small rounded plate (epivertex) bearing two short setae; three pairs of setae, one of which is sensory, are also present on the propodosoma. The hysterosoma bears seven to ten pairs of dorsal setae. The fourth pair of legs and especially ~~their~~<sup>its</sup> second segments which are highly swollen, are thicker than the others.

Eupodes fusiferellus, n.sp.

(Figs. F 1-4)

This species is near E. fusifer Can. and E. parafusifer, n.sp. but differs from them in the following respects: The relatively short body setae, leg I which is longer than the body and the absence of a suture. In E. vallombrosae Thor the suture is also absent but the latter differs from this species in the dorsal setae which are not spindle-shaped.

Dimensions: Length of body (excluding gnathosoma) 380  $\mu$ ; length (including gnathosoma) 470  $\mu$ ; breadth of body 201  $\mu$ ; length of leg I 614  $\mu$ . The body is egg-shaped.

Dorsum (fig. 1). This species differs from most of the other species of Eupodes in the absence of a suture between the propodosoma and the hysterosoma. The propodosoma bears two relatively short setae, which are situated anteriorly near the bases of the chelicerae, as well as two pairs of spindle-shaped and one pair of sensory setae which are finely setose. The hysterosoma is provided with ten pairs of setae of which the scapular pair measure 88  $\mu$ ; the two pairs of median setae measure 80  $\mu$ , and one pair of long spindle-shaped setae (fig. 2) near the posterior margin measure 115  $\mu$ . The bases of nine of the ten pairs of hysterosomals and all the propodosomal setae are not swollen to the same degree as those of E. fusifer and E. parafusifer; they are more linear-lanceolate than spindle-shaped. No eyes could be observed.

Venter. The genital opening (fig. 3) is provided with five pairs of clavate setose setae. All the ventral setae are clavate and finely setose.

Gnathosoma. The second and third palpal segments are the longest (fig. 4); the fourth is oval-shaped and provided with

seven.....

seven.....

seven setae. As in other species of Eupodes the chelicerae are each provided with small, somewhat deformed, chelae.

Legs. The first pair of legs ~~are~~<sup>is</sup> much longer than the body; the fourth pair ~~are~~<sup>is</sup> thickened. All the legs are covered with relatively long setae. Two claws and a hairy empodium are present on each tarsus.

Habitat and locality. The holotype from grass and soil, Bathurst, June 1956. Collected by P. Graham.

Eupodes parafusifer, n.sp.

(Figs. F 5-7)

This species resembles the above-mentioned species of the genus but differs from E. fusifer in that the four pairs of posterior setae are not spindle-shaped

Dimensions; Length of body (excluding gnathosoma) 456  $\mu$ ; length (including gnathosoma) 530  $\mu$ ; breadth of body 258  $\mu$ ; length of leg I 400  $\mu$ , leg II 194  $\mu$ , leg III 231  $\mu$ , leg IV 314  $\mu$ . The body is oval-shaped.

Dorsum (fig. 5). The propodosoma is separated from the hysterosoma by a suture and is anteriorly provided with a small plate which bears two short setae. Anterior to the sensory setae, which measure 100  $\mu$ , a pair of spindle-shaped setae are situated and posterior to them the propodosoma bears a pair of setae, the bases of which are not conspicuously swollen. The sensory setae are finely setose.

The hysterosoma bears ten pairs of setae of which six pairs are spindle-shaped (fig. 6) and four pairs, which are arranged in two rows at the posterior margin of the body, are linear-lanceolate. In this respect it differs from

E. fusifer.....

*E. fusifer*.....

*E. fusifer* in which, according to Thor (1941), all these setae, except one pair, are spindle-shaped. No eyes could be observed.

Gnathosoma. The second segment of the palpus is the longest and is provided with setose setae whereas the third and fourth segments bear three and four setae respectively (fig. 7). The chelicerae are similar to those of other species of *Eupodes*.

Legs. Compared with *E. fusifer* the first pair of legs are short (less than the body length). The second segment of the fourth pair of legs is thickened. The tarsus is provided with two claws and an empodium.

Habitat and locality. The holotype from grass, collected near the source of the Mooi river, Potchefstroom, June 1958; the paratype from *Medicago sativa*, Potchefstroom, May 1958.

*Eupodes variegatus* Koch, 1838

(Figs. F 8-9)

*Eupodes variegatus* is a very common European species but was not previously recorded from South Africa.

Dimensions: Length of body (excluding gnathosoma) 371  $\mu$ ; length (including gnathosoma) 423  $\mu$ ; breadth of body 209  $\mu$ ; length of leg I 460  $\mu$ , leg II 244  $\mu$ , leg III 223  $\mu$ , leg IV 350  $\mu$ . This oval-shaped mite is pale rose in colour.

Dorsum (fig. 8). A suture separates the propodosoma from the hysterosoma. Anteriorly the propodosoma is provided with a small plate on which a pair of short setae are situated. A pair of moderately long sensory setae and two pairs of shorter setae are also present on the propodosoma. No eyes could be detected in the specimens examined but according to

Thor.....

Thor.....

Thor (1941) this species has one lateral eye.

The hysterosoma bears ten pairs of setae of which six pairs are arranged in three rows at the posterior end of the body. All the dorsal setae are finely setose and bluntly pointed.

Gnathosoma. The second segment of the four-segmented palpus (fig. 9) is the longest. The second segment is provided with two setose setae and the third and fourth bear three and seven respectively. The chelae of the chelicerae are small and deformed.

Legs. The first pair of legs ~~are~~<sup>is</sup> one and a quarter times as long as the body; the fourth pair ~~is~~<sup>is</sup> somewhat shorter than the body and has a thickened fourth segment. Two claws and a hairy empodium are present on each tarsus.

Habitat and locality. Specimens were collected from grass on river bank, Boskop, June 1958 and the source of the Mooi river, Potchefstroom, June 1958.

Eupodes longipilus Thor, 1934

Eupodes longipilus has the following characteristics: The dorsal setae are 90-140  $\mu$  long except for the internal humeral setae which measure 180  $\mu$ . The two setae which are situated on the posterior margin of the epivertex are 40  $\mu$  long while the sensory setae on the propodosoma measure 100  $\mu$ . The dorsal setae are feathered. The legs are of moderate length; the first pair ~~are~~<sup>is</sup> longer than the body. The setae on the legs are well-developed. The second segment of the fourth pair of legs is of moderate thickness and is provided with long setae. The length of the body is 600-640  $\mu$  and the breadth is 415-430  $\mu$ .

The species was found in the vicinity of Cape Town but Thor (1934) did not mention the habitat.

Genus LINOPODES Koch, 1836

The separation of the genus Linopodes from other genera of the family Eupodidae presents no problem. Leg I is from two to six times longer than the body. This pair of legs ~~are~~<sup>is</sup> probably used as tactile organs. The fourth pair of legs ~~are~~<sup>is</sup> slightly enlarged.

Linopodes motatorius africanus, n.subsp.

(Fig. F 10-13)

This subspecies differs from L. motatorius (L.) in the relative length of the body and the first pair of legs which ~~are~~<sup>is</sup> nearly four times the length of the body. The body is egg-shaped.

Dimensions: Length of body (excluding gnathosoma) 420  $\mu$ ; length (including gnathosoma) 598  $\mu$ ; breadth of body 308  $\mu$ ; length of leg I 1550  $\mu$ , leg II 412  $\mu$ , leg III 424  $\mu$ , leg IV 585  $\mu$ .

Dorsum (fig. 10). The suture between the propodosoma and hysterosoma is absent. The propodosoma is provided with four pairs of setae. According to Thor & Willmann (1941) the hysterosoma of L. motatorius bears ten to eleven pairs of setae but in this case only seven pairs could be observed. The others may be broken off but no trace of setal bases could be found probably due to the fact that the specimen was overcleared. All the dorsal setae are relatively short and finely setose (fig. 11); the posterior setae are somewhat longer than the others.

Venter. The genital opening (fig. 12) is provided with three pairs of setose setae. Two pairs of genital suckers are present.

Gnathosoma. The second segment of the palpus is the longest (fig. 13). The palpal tarsus is narrow and distally pointed. It is provided with six setae. The chelicerae are each provided with small deformed shears.

Legs. According to Thor & Willmann (1941) the first pair of legs of L. motatorius ~~are~~<sup>is</sup> four to six times longer than the body. In L. motatorius africanus the first pair of legs ~~are~~<sup>is</sup> less than four times the length of the body. As in L. motatorius the second, fifth and sixth segments of leg I are extraordinarily long. All the tarsi are provided with two claws and a hairy empodium; the claws and empodium of leg I are weaker than those of the other legs. As in L. motatorius the second segment of the fourth pair of legs ~~are~~<sup>is</sup> thickened.

Habitat and locality. One holotype female from grass and soil, Bathurst, June 1956.

#### Genus HALOTYDEUS Berlese, 1891

Many of the species belonging to this genus were formerly placed in the genus Penthaleus Koch. These two genera can be distinguished from each other by the position of the anal opening which is situated terminally in Halotydeus and dorsally in Penthaleus. The dorsal setae are plumose.

#### Halotydeus destructor (Tucker) 1925

(Black sand mite)

(Figs. F 14-15)

This mite was first recorded by Jack in 1908 under the name of Penthaleus destructor. Tucker (1925) described it for the first time in detail and retained this name. In 1923 it was also described by Newman under the name Notophallus bicolor, which was formerly given to an allied species.

Female (fig. 14)

Dimensions: Length of body 800  $\mu$ ; breadth of body 500  $\mu$ . This mite is more or less pear-shaped and is black in colour.

Dorsum. The propodosoma is provided with a pair of weak sensory setae and two pairs of plumose setae distributed as shown in the figure. Anteriorly the propodosoma has a small rounded plate (epivertex) which carries two short setae. The hysterosoma bears eight plumose setae.

Venter. The genital opening is provided with seven pairs of setae. Two pairs of genital suckers are present. All the ventral setae are plumose. The slit-like anus is terminal in position.

Gnathosoma. The palpus is four-segmented; the second and third segments each bears two plumose setae while the fourth is provided with six. The chelicerae (fig. 15) are shear-like.

Legs. The first pair of legs which are slightly longer than the body, ~~are~~<sup>is</sup> the longest while the second and third pairs are the shortest. The tarsus terminates in two strong claws and a hairy empodium. All the legs are covered with plumose setae.

Male. The males are not known and as suggested by Tucker (1925) this species probably reproduces parthenogenetically.

Habitat and distribution. Halotydeus destructor is distributed in South Africa and Australia. In these two countries this species is a serious pest of vegetable and leguminous crops as well as cultivated flowers and weeds.

Specimens of this mite were found abundantly in the Cape Flats and elsewhere in the Western Cape Province.

Genus PENTHALEUS Koch, 1836

Thor & Willmann (1941) and Womersley (1933) considered

Notophallus.....



Notophallus .....

Notophallus Can. 1886 to be synonymous with Penthaleus.

The members of this genus can be differentiated from the species of related genera by the stout body, the short setae and the dorsally situated anus. The legs are relatively long. The integument may be striated, punctated or smooth.

Penthaleus major (Dugés), 1834

(Figs. F. 16-20)

Thor & Willmann (1941) consider Penthaleus haematopus Koch 1835 and P. insulanus Thorell 1872 as synonyms of P. major. Womersley (1933) treated P. bicolor 1929 as a synonym of P. major but Thor & Willmann (1941) are uncertain about its identity. According to the latter authors it either represents a different species or a variety of P. major but they do not exclude the possibility of synonymy.

Female (fig. 16)

Dimensions: Length of body (excluding gnathosoma) 940  $\mu$ ; length (including gnathosoma) 1014  $\mu$ ; breadth of body 719  $\mu$ .

The colour is black with a red dorsal patch anteriorly on the propodosoma and another one surrounding the anus; the legs are red.

Dorsum. The suture between the propodosoma and the hysterosoma is absent. An epivertex which bears two short setae, is present. The propodosoma is provided with one pair of relatively long sensory setae and three pairs of short setae. Each side of the propodosoma bears a single eye. The hysterosoma is provided with fourteen pairs of short setae. The anus is situated on the posterior portion of the hysterosoma (fig. 17).

Venter. Two pairs of genital suckers (fig. 17) are present.

Gnathosoma. The segments of the four-segmented palpi (fig.18) are relatively short and broad. The fourth segment is shorter than the third and is provided with five to six short setose setae. The chelicerae (fig. 19) are long and thick, the chelae are strong. The fixed digit ends in finger-like projections. The movable chela is sickle-shaped.

Legs. The legs are of moderate length; the first and the fourth pair are the longest. Legs I are longer than the body. Each of the tarsi (fig. 20) is provided with two claws and a haired empodium.

Habitat and locality. Penthaleus major is commonly called the Blue oat or Pea mite. This species which is a pest of pasture and forage crops was recorded by Jack (1908) and Tucker (1925) from South Africa.

Specimens were collected by H.B. McNaughton, Elandskloof, Graaff-Reinet, from oats and lucerne, July 1958.

#### FAMILY RHAGIDIIDAE OUDEMANS, 1922

The rhagidiids are long, delicate mites which appear to be predacious. A suture separates the propodosoma and the hysterosoma. A pair of poorly developed pseudostigmata with only slightly modified sensory setae are located on the propodosoma. Eyes are usually present. The chelicerae are strong and provided with opposed, grasping chelae. The palpal tarsus is cylindrical and provided with many short setae. Very characteristic are tarsi I and II which are each provided with a "Rhagidia organ". Coxae I-II and III-IV are in two separate groups. All the tarsi bear two claws and a haired empodium. Two pairs of genital suckers are present. Only two genera are known to date.

Genus COCCORHAGIDIA Thor, 1934

Coccorhagidia can be separated from the genus Rhagidia by the dorsal sensory setae (pseudostigmatic organs) which are club-shaped. The palpal tarsus is provided with eight to nine setae.

The members of this genus are usually smaller than those of Rhagidia. Only two species have been described in Coccorhagidia.

Coccorhagidia clavifrons (Can.), 1886  
(Figs. F 21-24)

According to Thor & Willmann (1941) C. clavifrons can be differentiated from C. subterranea (Berl.) (= C. berlesei) by the long elliptical palpal tarsus and the legs (especially leg IV) which are longer than the breadth of the body. Judging from the figures and description given by Thor & Willmann (1941) the South African forms, in certain respects, differ from the original Italian specimens. As recorded by Thor & Willmann (1941) and Turk & Turk (1952) specimens of C. clavifrons from other localities exhibit variations and therefore the South African form is treated as being conspecific with the type species. Turk & Turk (1952) suggested that the form which was recorded by them from Cornwall and by Thor (1930) from Svalbard may be a new species but the evidence rather indicates a cosmopolitan distribution of C. clavifrons; the South African species give further support for this view.

The body is long and delicate. As in specimens recorded by Thor (1930) the indentations in the body opposite to leg III and IV are absent.

Dimensions: Length of body (excluding gnathosoma) 641  $\mu$ ;  
length.....

length.....

length (including gnathosoma) 945  $\mu$ ; breadth of body 300  $\mu$

Dorsum (fig. 21). The suture between the propodosoma and the hysterosoma is inconspicuous. Anteriorly, the propodosoma is provided with an epivertex carrying two small setae. In this case the hirsute pseudostigmatic organs are less club-shaped than those figured by Thor & Willmann (1941). Two other pairs of propodosomal setae are also present. The seta which is situated between the pseudostigmatic organ and the external propodosomal seta is about one-third the length of the latter. Two pairs of eyes are figured by Thor & Willmann for C. clavifrons but in the specimen in hand no eyes could be located.

The hysterosoma is provided with nine pairs of setae. The longest of these are the scapular setae (the external setae of the anterior row) and the fifth pair of setae in the median row. The latter are longer than those figured by Thor & Willmann. All the dorsal setae are feathered.

Venter. Coxae I and II are close together and are widely separated from coxae III and IV.

Gnathosoma. The four-segmented palpi (fig. 22) are short, the last segment of each is long, elliptical and provided with eight strongly feathered setae. Segments II and III each carry a seta distally. The chelicerae (fig. 23) measure 140  $\mu$ . The fixed digit is provided with two setae and is bidentate distally. The movable digit measure 43  $\mu$  and the inner surface of the blade is minutely serrated.

Legs. All the legs are longer than the breadth of the body. Each tarsus ends in two claws and a haired empodium. The "Rhagidia organs" on tarsi I (fig. 24) and II are conspicuous and comprise four sensory fields.

Habitat and locality. One specimen was collected from grass and soil, Bathurst, January 1956. Collected by P. Graham.

SUPERFAMILY CUNAXOIDEA CUNLIFFE, 1955

This superfamily contains those mites in which the palpi may <sup>be</sup> highly developed for grasping or for the use as tactile organs; the gnathosoma is usually snoutlike and elongated; the chelicerae are separated and hinged at the base, capable of moving scissorlike in a lateral direction. Tarsus I possesses more than one rodlike sensory seta; the claws and empodia differ structurally in the two families constituting the superfamily.

It consists of the following two families: Cunaxidae Thor, 1902 and Bdellidae Dugés, 1834.

FAMILY CUNAXIDAE THOR, 1902

The members of this predacious family may be readily recognised by the long conelike gnathosoma. The long and convergent pincerlike palpi are used for grasping; on the inner side they are provided with strong spines and apophyses. There are four distinct sensory setae on the propodosoma.

Genus CUNAXA V. Heyden, 1826

Species of this genus were originally placed in the genus Scirus Berl. which actually belongs to the family Bdellidae. Baker & Hoffman (1948) consider the genus Dactyloscirus Berl. as a synonym of Cunaxa.

This genus may be distinguished by the five-segmented palp; segments II and III are partially fused; the palpi are much longer than the chelicerae; the palpal spines are simple; the eyes are absent.

Cunaxa setirostris (Hermann), 1804

(Figs. G 1-4)

Hermann described this species under the name Scirus setirostris.

The.....

The.....

The genus Scirus is, however, considered to be a synonym of the genus Bdella which belongs to the family Bdellidae. In 1826 the genus Cunaxa was created by Von Heyden and Scirus setirostris was considered as the type. Since then the combination Cunaxa setirostris has been used.

This species can be recognised by a five-segmented palp which has one spine on the medial side of each of the third, fourth and fifth segments.

Female (fig. 1)

Dimensions: Length of body 514  $\mu$ ; breadth of body 390  $\mu$ .  
The colour is red.

Dorsum. The propodosoma is covered by a plate which is surrounded by striations. There are four long finely setose sensory setae on the propodosoma, the posterior pair being the longest, and in addition, two pairs of short simple setae.

The hysterosoma is finely striated and has six pairs of simple setae which are much shorter than the distances between them. Judging from the figures given by Baker & Hoffman (1948) there are five pairs of hysterosomals of which the second and third median dorsal hysterosomals are widely separated. In the South African specimens the distances between the six pairs of dorsal hysterosomal setae are approximately the same. According to Thor & Willmann (1941) this species may have five or six pairs of dorsal setae on the hysterosoma.

Venter. Four pairs of genital setae are present.

Gnathosoma. The palp exhibits the typical diagnostic characters of the species. It is of moderate size; segments II and III are partially fused but the union is difficult to observe; distally segment II bears one seta on its lateral side.....

side.....

side; segment III bears one strong spine on its medial side and one seta on the opposite side; distally, segment IV is provided with a medially situated spine and two simple setae on its lateral surface; medially the posterior part of segment V bears a proximal long seta and a distal spine; the distribution of the setae on its anterior half is shown in fig. 2.

Legs. The legs are of normal length; the tarsi each has two claws and an empodium.

Male (fig. 4)

Dimensions: Length of body 301  $\mu$ ; breadth of body 209  $\mu$ . It is similar to the female except that its body is smaller and narrower posteriorly. The genital aperture and genital plates are also smaller. The four sensory setae on the dorsum and the simple setae on the legs are relatively longer.

Habitat and distribution. This cosmopolitan species is here recorded from South Africa for the first time. One female taken from Citrus sinensis, Munster, April 1955, five females from unidentified shrubs and trees, Munster, April 1955; one male from grass and organic material, Bathurst, June 1956.

FAMILY BDELLIDAE DUGÈS, 1834

These predacious mites have long, elbowed, five-segmented palpi which are used as sensory organs. The distal segment of the palpus bears two long sensory setae. The chelicerae are elongated and provided with small, distal shears of equal length. A long protruding rostrum is present as a consequence of which these mites are known as "snout mites". The integument is usually thin and striated and the propodosoma

is.....

is.....

is often provided with subcutaneous plates.

Grandjean (1938) divided this family into four subfamilies Cytinae, Spinibdellinae, Odontoscirinae and Bdellinae.

Key to the South African genera and species of the family  
Bdellidae

1. Venter of rostrum with two pairs of strong posterior and two pairs of weak anterior setae; with well-developed genital tracheae.....2

--. Venter of rostrum with six pairs of strong setae and two pairs of weak anterior setae; without well-developed genital tracheae.....3

2. An unpaired seta present anterior to genital opening.....Subfamily Cytinae

Fifth palpal segment shortened and broadened towards distal end and with two or three long setae distally; rostrum and chelicerae short and thick; an unpaired median eye and two pairs of lateral eyes...Cyta

V. Heyden

a. Without a conspicuous subcutaneous plate; anterior and posterior pseudostigmatic sensory setae on propodosoma measure 229  $\mu$  and 167  $\mu$  respectively....C. phaseoli, n.sp.

---. A pair of setae present anterior to the genital opening.....Subfamily Spinibdellinae

Fifth palpal segment relatively long; each chelicera provided with two setae; propodosoma usually with two, seldom three pairs of dorsal setae.....Biscirus Thor



- a. Distal seta of the chela nearly twice as long as the proximal one; fifth palpal segment two-thirds of the length of the second; fourth palpal segment shorter than the third.....B. macfarlanei, n.sp.

3. Tibiae I, II and IV and tarsi III and IV with a long sensory seta.....(Subfamily Odontoscirinae)....4

--. Tibiae I and IV and tarsi III and IV with a long sensory seta.....Subfamily Bdellinae

Fifth palpal segment shortened and broadened distally and with two or three terminal setae; rostrum and chelicerae small or minute; median eye absent but two pairs of lateral eyes present; dorsal plates separate or united by a weak connection.....Bdella Latreille

- a. Propodosoma dorsally with two longitudinal subcutaneous plates and a posterior and anterior pair of long sensory setae, measuring 230  $\mu$  and 158  $\mu$  respectively; outer and inner terminal setae of palpal tarsus measure 168  $\mu$  and 100  $\mu$  respectively....B. neograndjeani, n.sp.

- . Propodosoma without subcutaneous plates; posterior and anterior pair of sensory setae on propodosoma not very long, measuring 100  $\mu$  and 87  $\mu$  respectively; outer and inner terminal setae of palpal tarsus measure 236  $\mu$  and 149  $\mu$  respectively.....B. thori, n.sp.

4. Each chela with one seta; dorsal plates absent...Bdellodes  
Oudemans.....

Oudemans.....

Oudemans

- a. Palp very long and thin (2000  $\mu$ ); fourth segment one and a half times as long as the third; the fifth twice as long as the third and fourth together; length of body (excluding rostrum) 2600

$\mu$ .....B. exilicornis (Berl.)

- . Palp 725  $\mu$  long; fourth segment as long as the third; shears of the chelicerae dentated; length of the body 2100  $\mu$ .....B. hessei (Womersley)

- . Each chela with two setae; dorsal plates may be present.....Odontoscirus Thor

- a. Fixed arm of the chela with two teeth, movable one with four to five median teeth; two setae on chela well-separated; rostrum with six pairs of ventral setae.....O. virgulatus (Can. & Fan.)

SUBFAMILY BDELLINAE GRANDJEAN, 1938

The members of this subfamily can readily be recognised by the presence of a long sensory seta which is situated on each of tibiae I and IV and tarsi III and IV. The genital tracheae are not well-developed.

Genus BDELLA Latreille, 1795

The members of this genus differ from those of Cyta in the absence of a median eye. The rostrum and chelicerae are either small or minute. The two dorsal longitudinal subcutaneous plates are either separated or only united by means of a weak connection.

As.....

As.....

As in Cyta the fifth palpal segment is shortened and broadened towards the distal end and it bears two or three long setae distally. The chelicerae each bears two dorsal setae.

Oudemans (1937) considers Scirus Hermann 1804 as a synonym of Bdella.

Bdella neograndjeani, n.sp.

(Figs. G 5-8)

The length of the sensory setae on the propodosoma and certain aspects of the palpal tarsus distinguish this species from other members of the genus Bdella. It resembles Bdella longicornis (Linn.) and B. grandjeani Thor. The terminal setae on the palpal tarsus of B. longicornis are longer than those of the new species and B. grandjeani can be separated from it on account of the subcutaneous plates which are somewhat shorter and weaker.

Female (fig. 5)

Dimensions: Length of body (excluding gnathosoma) 633  $\mu$ ; length (including gnathosoma) 913  $\mu$ ; breadth of body 389  $\mu$ . The pear-shaped body is posteriorly narrowed.

Dorsum. The propodosoma and the hysterosoma are not separated by a suture. The propodosoma is provided with two pairs of eyes and two longitudinal subcutaneous plates. A pair of very long sensory setae which measure 230  $\mu$ , ~~are~~<sup>is</sup> situated at the posterior ends of the plates and another pair which ~~are~~<sup>is</sup> 158  $\mu$  long, ~~are~~<sup>is</sup> placed at their anterior ends. Two pairs of short spine-like setae are also present near the propodosomal plates. The striations between and lateral to the plates are arranged longitudinally.

The hysterosoma bears eight pairs of short spine-like  
setae.....

setae.....

setae. The striations in the median region of the hysterosoma are transverse while those on the lateral sides are tortuous.

Venter. The anus is terminal. The genital opening (fig. 6) is slitlike and the genital plate is provided with five setae on each genital cover.

Gnathosoma. Ventrally, the rostrum (fig. 7) bears six pairs of setae. In this respect it differs from B. grandjeani which according to Thor (1931a), has two, three or seldom four pairs of setae. Distally, the elongated chelicerae are narrow and basally they are broad while each bears two setae. The five-segmented palp (fig. 8) resembles those of B. grandjeani but the two end setae are relatively shorter; they are also much shorter than those of B. longicornis. The outer and inner setae measure 168  $\mu$  and 100  $\mu$  respectively. The fifth segment which is broadened towards the distal end, also bears three additional setae.

Legs. The legs are stout and each terminates in two claws and a hairy empodium. Tibia I, tarsus III and tibia and tarsus IV each bear a long sensory seta.

Habitat and locality. One holotype female and two paratype females from grass and soil, Bathurst, January 1956. Collected by P. Graham.

Bdella thori, n.sp.

(Figs. G 9-10)

This species can readily be separated from its relatives on account of the length of the two end setae on the palpal tarsus and the absence of the subcutaneous plates.

Female (fig. 9)

Dimensions: Length of body (excluding rostrum)  $740\ \mu$ ;  
length (including rostrum)  $880\ \mu$ ; breadth of body  $450\ \mu$ .

Dorsum. There is no suture between the propodosoma and the hysterosoma. Two pairs of eyes are situated on each side of the propodosoma. As in B. chapultepecensis Baker & Balock, B. cronini Baker & Balock and B. mexicana Baker & Balock the dorsal subcutaneous plates of the propodosoma are absent. The propodosoma is provided with four pairs of setae, two of which are sensory; the anterior pair of sensory setae measure  $87\ \mu$  and the posterior pair  $158\ \mu$ . The striations on the propodosoma are mostly transverse.

The hysterosoma bears eight pairs of simple spine-like setae, the posterior setae being longer than the others. In the median region of the hysterosoma the striations are transverse.

Gnathosoma. As in B. lignicola Can. the rostrum is long and narrow, but it only bears two instead of three pairs of setae. The chelicerae are elongated and are each provided with dorsal setae. The five-segmented palp (fig. 10) is somewhat shorter than the rostrum; the second segment is the longest; the fifth segment is short and rounded in front and as shown in figure, bears four short setae and two very long end setae which measure  $236\ \mu$  and  $149\ \mu$  respectively.

Legs. Each of the legs terminates in two claws and a hairy empodium. As in B. spinirostris Koch and other species tibia I, tarsus III and tibia IV and tarsus IV each bear a long sensory seta.

Habitat and locality. One holotype from grass and soil, Bathurst, June 1956. Collected by P. Graham.

SUBFAMILY CYTINAE GRANDJEAN, 1938

This group of mites ~~are~~<sup>is</sup> characterised by an unpaired seta which is situated anterior to the genital opening; ~~they have~~ well-developed genital tracheae.

Genus CYTA V. Heyden, 1826

The characteristics of this genus can be summarised as follows: The fifth palpal segment is shortened and broadened towards the distal end which is provided with two or three long setae; the rostrum and chelicerae are short and thick, the latter are each provided with two dorsal setae; the propodosoma bears two pairs of long sensory setae and is usually provided with a subcutaneous plate. An unpaired median eye and two pairs of lateral eyes are present on the propodosoma. Ammonia Koch, 1836 is the only existing synonym.

Cyta phaseoli, n.sp.

(Figs G 11-14)

Cyta phaseoli can be distinguished from the related species by the absence of a conspicuous subcutaneous plate and the relative lengths of the pseudostigmatic sensory setae.

Female (fig. 11)

Dimensions: Length of body (excluding gnathosoma) 758  $\mu$ ; breadth of body 546  $\mu$ . The body is egg-shaped.

Dorsum. The propodosoma is not separated from the hysterosoma by a distinct suture. The striations on the propodosoma are mostly longitudinal; in the middorsal region of the hysterosoma they are transverse but laterally the striations are also longitudinal. No subcutaneous plate could be detected

om.....

on.....

on the propodosoma. In this respect it differs from C. latirostris Herm. which has, according to Thor (1931b), a conspicuous subcutaneous plate. Garman (1948), however, did not figure any subcutaneous plate in C. latirostris. C. phaseoli resembles C. coeruleipes Dugés and C. novangliae Jacot which also lack a conspicuous subcutaneous plate. The propodosoma bears four pseudostigmata, each being provided with a long seta; these setae are relatively longer than those of C. latirostris but somewhat shorter than those of C. coeruleipes. The anterior pair measure 167 $\mu$  and the posterior pair 229 $\mu$ . According to the brief description given by Jacot (1939) for C. novangliae, the sensory setae of the latter are much longer than those of C. latirostris; the description (without a figure), however, is entirely inadequate for purposes of comparison with C. novangliae. As in C. latirostris a pair of much shorter setae are situated immediately in front of the posterior pair of sensory setae but it differs from C. coeruleipes in the location of these setae which appear more anteriorly in the latter species. One median eye, and two pairs of lateral eyes are situated on the propodosoma. Eight pairs of setae which are shorter than the distances between their bases, are present on the medio-dorsal region of the dorsum. More laterally, another pair of setae are situated opposite leg III.

Venter. The genital opening is slitlike and has two pairs of setae near its lateral margins.

Gnathosoma. The five-segmented palpi, each bear a cylindrical short tarsus which is provided with two long distal setae and three shorter setae. These distal setae are somewhat longer than those of C. latirostris. The chelicerae and the rostrum are short and thick; each of the chelicerae bears two dorsal setae.

Legs. All the legs are much shorter than the body. The tarsus bears two claws and an empodium which is provided with a large number of short setae.

Habitat and locality. One holotype female from Phaseolus vulgaris, Grabouw, December 1953.

SUBFAMILY ODONTOSCIRINAE GRANDJEAN, 1938

The members of this subfamily bear a long sensory seta on each of tibiae I, II and IV and tarsi III and IV. The genital tracheae are well-developed.

Genus BDELLODES Oudemans, 1937

Oudemans (1937) considered the genus Scirus as synonymous with Bdella and created the genus Bdellodes for the species which in Thor's (1931b) view, constituted the genus Scirus.

The diagnostic characteristics of this genus are the following: The palpal tarsus is cylindrical and very long, in some cases longer than the femur of the palp. Each of the chelicerae bears one seta. The dorsal plates are absent.

Bdellodes exilicornis (Berl.), 1910

This species was originally described under the name Bdella exilicornis. Thor (1931b) placed it in the genus Scirus but Oudemans (1937) created the genus Bdellodes to accommodate the Scirus species of Thor.

It is a large red mite which bears some resemblance to Bdella longicornis (Linn.). The palp is very long (about 2000  $\mu$ ) and thin. The segments have the following measurements: segment II, 850  $\mu$  long; segment III, 150  $\mu$ ; segment IV 220  $\mu$ ; segment V, 750  $\mu$  long and 40  $\mu$  broad (it is thinner than the others).

The.....



The.....

The fifth segment is twice as long as the corresponding segment of Scirus longirostris Hermann; it bears five setae medially and four laterally. The distal setae are longer than the others. The body (excluding the rostrum) is 2600  $\mu$  long and 1300  $\mu$  broad.

Berlese described this species from Cape Town but he did not mention the habitat.

Bdellodes hessei (Womersley), 1933

Womersley described this species under the name Scirus hessei but since it exhibits the diagnostic characteristics of Bdellodes it should be referred to this genus.

According to Womersley (1933) it closely resembles Odontoscirus virgulatus. Although it has dentated chelicerae it possesses only a single seta on each chelicera as a result of which Womersley placed it in the genus Scirus.

The following are the characteristics of the species: the length of the body is 2.1 mm. The rostrum is provided with five pairs of ventral setae. The chelicerae are long and reach to the tip of the rostrum; each measures 430  $\mu$ . A seta which is 65  $\mu$  long is situated 125  $\mu$  from the tip of each chelicera. The palpi are 725  $\mu$  long. The segments have the following measurements: II, 300  $\mu$ ; III, 50  $\mu$ ; IV, 50  $\mu$ ; V, 310  $\mu$ . The apical setae of the fifth segment are respectively 110  $\mu$  and 100  $\mu$  long. The second segment bears seven to eight setae, the third one, the fourth four and the fifth twelve setae. The fixed chela of the chelicera is provided with two teeth and the movable digit bears a strong apical tooth and four smaller median teeth. Two eyes are present on each side of the body. The chaetotaxy of the body and legs is normal.

According to Womersley these specimens were found in a

tube.....

tube.....

tube with Collembola collected by Dr. Hesse at Stellenbosch.

Genus ODONTOSCIRUS Thor, 1913

Thor (1913) divided the genus Biscirus into two subgenera namely Odontoscirus and Biscirus. The members of the genus Odontoscirus are provided with dentated cheliceral shears, teeth being absent on those of Biscirus. Later Odontoscirus received generic status and was placed in the subfamily Odontoscirinae.

Odontoscirus virgulatus (Can. & Fanzago), 1876  
(Figs. G. 15-17)

This species was originally described as Bdella virgulata. When the genus Odontoscirus was created it became the type of this genus.

Female (fig. 15)

Dimensions: Length of body (excluding gnathosoma) 1500  $\mu$ ; length (including gnathosoma) 2140  $\mu$ ; breadth of body 950  $\mu$ . The body is long and more or less oval-shaped.

Dorsum. The propodosoma is provided with a fine subcutaneous plate which bears three pairs of setae. The hysterosoma is provided with nine pairs of setae. The dorsal integument is finely striated.

Venter. The genital opening is flanked by seven pairs of setae.

Gnathosoma. Ventrally, the rostrum is provided with six pairs of setae. The fifth segment of the palpus is relatively long and cylindrical; apically it is provided with two long setae. The chelicerae have the same length as the rostrum and

bear#.....

bears.....

bears two well-separated setae. The shears of the chelicerae are of equal length; the fixed chela bears two teeth while the movable chela is provided with five median teeth.

Legs. The legs are relatively long, the fourth pair being the longest. The tarsus is provided with two well-developed claws and a rounded empodium which is covered with fine setae. The tarsi of all the legs are distally covered with setose setae.

Habitat and distribution. This predacious species was recorded from South Africa by Womersley (1933). He found this species in considerable numbers with Halotydeus destructor (Tucker) but no evidence could be obtained as to whether this mite attacked Halotydeus destructor.

The female specimen figured here was collected by P. Graham from grass and dead organic material, Bathurst June 1956.

SUBFAMILY SPINIBDELLINAE, GRANDJEAN, 1938

These mites are provided with a pair of setae anterior to the genital opening. The genital tracheae are well-developed.

Genus BISCIRUS Thor, 1913

In comparison with the genus Bdella the fifth palpal segment of the members of Biscirus are relatively long and not shortened or broadened. This segment is distally provided with two relatively long setae. The rostrum is long. The propodosoma bears two, seldom three pairs of setae. A weak dorsal plate is usually present. Each chelicera bears two setae.

Biscirus macfarlanei, n.sp.

(Figs. G 18-23)

Biscirus macfarlanei can be differentiated from the other.....

other.....

other species of the genus Biscirus by the distal seta of the chela which is nearly twice as long as the proximal one.

Female (fig. 18)

Dimensions: Length of body (excluding gnathosoma) 1342  $\mu$ ; length (including gnathosoma) 1642  $\mu$ ; breadth of body 700  $\mu$ . A large, red egg-shaped mite.

Dorsum. The entire dorsum is finely striated and there is no suture between the propodosoma and the hysterosoma. The striations on the propodosoma are transverse and tortuous. In the median region of the hysterosoma they are mostly transverse and form diamond-shaped figures between the consecutive setae; laterally the striations are longitudinal and tortuous. Two pairs of separated eyes are located on the lateral margins of the propodosoma. No dorsal plates could be traced.

The propodosoma is provided with two pairs of setae, the posterior pair being more than two times as long as the anterior pair. The hysterosoma bears seven spine-like, finely setose setae (fig. 19).

Venter. The genital opening (fig. 20) is provided with seven pairs of setae.

Gnathosoma. The rostrum is ventrally provided with four setae. Each of the chelicerae (fig. 21) is provided with two setae which are widely separated as in B. insularis Willman, B. australicus Womersley, B. lapidarius (Kramer), B. uncinatus (Kramer), B. hickmani Womersley and B. thori Womersley. It, however may be distinguished from these species by the distal seta (71  $\mu$ ) which is much longer than the proximal one (39  $\mu$ ).

The palpus (fig. 22) is five-segmented. As in B. australicus the fifth segment is about two-thirds the length of the second one.....

one.....

one. In this respect it differs from B. symmetricus (Kramer) in which these segments are of equal length. Two distal setae which measure 89  $\mu$  and 106  $\mu$  respectively, and eleven additional setae are borne on the fifth segment. In comparison with B. uncinatus and B. insularis the fourth segment is shorter than the third and not longer as is the case in these species.

Legs. The legs are normal. The distal setae on the tarsus are setose. Each tarsus (fig. 23) terminates in two claws and a hairy empodium.

Habitat and locality. One holotype female from an unidentified wild herb, Munster, Natal, April 1955; one paratype female from an unidentified Palm tree, Munster, April 1955.

#### SUPERFAMILY TYDEOIDEA CUNLIFFE, 1955

The members of this superfamily have simple palpi; the chelicerae are fused; the fixed chela is degenerate and the movable chela is small and stylet-like. The genital opening may or may not possess genital suckers. The tarsi, which are characteristic of these mites, are provided with few setae, a simple, erect striated rod-like sensory seta (two in Paratydeidae) and rayed claws with a pad-like empodium (except in the Paratydeidae where the empodium is claw-like and the claws are simple).

The superfamily Tydeoidea comprises the families Tydeidae Kramer, 1877, Speleognathidae Womersley, 1936, Ereyneidae Oudemans, 1931 and Paratydeidae Baker, 1949.

#### FAMILY TYDEIDAE KRAMER, 1877

The tydeids are small and weakly coloured yellow, red, brown  
or.....

or.....

or green mites. The body shape varies but is usually egg-shaped. The integument is soft and provided with punctated striations, in some species forming a punctated or reticulated pattern. The body is sparsely covered with setae and a pair of sensory setae are located on the propodosoma. The propodosoma and hysterosoma are usually separated by a distinct suture. The legs terminate in two claws and a haired empodium, except in Pronematus where claws and empodia are absent on legs I and in Proctotydaeus where all the legs are devoid of empodia; claws are also absent on legs I of the latter genus. The chelicerae have a thick basal portion and a very sharp-pointed, fixed chela from which a dagger-like, almost straight, movable chela extends in such a way that the chelicerae are not truly chelate. In some species the eyes are absent, others possess two or three eyes. The genital suckers are absent.

Key to the South African genera and species of the family  
Tydeidae

1. Legs with claws and empodia; dorsum with punctated striations; two eyes present or absent; sensory setae slender.....Tydeus  
Koch
  - a. Eyes present; length 170  $\mu$ , breadth 74  $\mu$ .....  
.....T. citri Tucker
  - . Eyes absent.....b
- b. Dorsal setae lanceolate; suture absent; length of body (excluding gnathosoma) 238  $\mu$ ; length (including gnathosoma) 258  $\mu$ ; breadth 164  $\mu$ .....T. munsteri,  
n.sp.

--. Dorsal setae not lanceolate; suture present....c

c. All the dorsal setae (about 17-22  $\mu$  long) setose; sensory setae measuring 44  $\mu$ ; length of body (excluding gnathosoma) 328  $\mu$ ; length (including gnathosoma) 399  $\mu$ ; breadth 212  $\mu$ ...T. grabouwi, n.sp.

--. Dorsal setae (20  $\mu$ ) rodlike and bluntly pointed; length of body (excluding gnathosoma) 225  $\mu$ ; length (including gnathosoma) 258  $\mu$  ; breadth 131  $\mu$ .....T. eriophyes, n.sp.

--. Leg I without claws and an empodium but with four or five distal setae.....Pronematus Canestrini

a. Dorsal setae about 21-23  $\mu$  long; sensory setae measuring 30  $\mu$  and the lateral posterior pair of hysterosomal setae 40  $\mu$ ; tarsus I 25  $\mu$  long and tibia I 17  $\mu$ ; longest pair of distal setae of tarsus I measuring 42  $\mu$  and the shortest pair 22  $\mu$ ; length of body (excluding gnathosoma) 263  $\mu$ ; length (including gnathosoma) 319  $\mu$ ; breadth 169  $\mu$ .....P. pruni, n.sp.

Genus TYDEUS Koch, 1836

These mites are usually white. The integument is rarely smooth, more often it is marked with punctated striations. The body setae are short. The sensory setae on the propodosoma are slender and relatively long. Eyes may be absent or present. All the legs end in two claws and a haired empodium.

Tydeus citri Tucker, 1926

Thor (1933) treated this species as one of the uncertain

Tydeus.....

Tydeus.....

Tydeus species. It has the following characteristics: The body tapers bluntly anteriorly and fairly sharply posteriorly. The colour is pale hyaline. A distinct suture is present between the propodosoma and the hysterosoma. The integument is finely striated. According to Thor the propodosoma is longer than broad and provided with the normal number of setae; these setae are inadequately figured by Tucker (1926). The hysterosomal setae are relatively long. One eye is present on each side of the body.

The rostrum is long and, according to Thor, the chelicerae resemble those of T. demeyerei Oudemans. They are long and are broad posteriorly and narrow anteriorly. The second segment of the chelicera is strong while the first segment is short and almost rudimentary. The fourth palpal segment is provided with four setae. Length 170 $\mu$ ; breadth 74 $\mu$ .

This species was collected by Tucker and Van der Merwe from oranges, Groot Drakenstein, Cape Province and from lemons, Durban, Natal.

Tydeus grabouwi, n.sp.

(Figs. H 1-5)

This species bears a close resemblance to T. subalpinus Thor. It differs from the latter by the absence of eyes and by the setae verticales internae and setae humerales internae which are setose.

Female (fig. 1)

Dimensions: Length of body (excluding gnathosoma) 328 $\mu$ ; length (including gnathosoma) 399 $\mu$ ; breadth of body 212 $\mu$ . The body is oval-shaped.



Dorsum. The suture between the propodosoma and the hysterosoma is inconspicuous. The integument is covered with punctated striations which are mainly straight and longitudinal on the propodosoma and tortuous on the hysterosoma. The propodosoma is provided with one pair of sensory ( $44\mu$ ) and three pairs of ordinary setae. The hysterosoma bears nine pairs of setae. Judging from the figure given by Thor (1932) for T. subalpinus, the setae verticales internae and the setae humerales internae are not setose. In the present species all the dorsal setae (fig. 2) are setose and measure  $17-22\mu$ . The eyes are absent.

Venter. The genital opening (fig. 3) is situated behind coxae IV. Six pairs of setae are placed around the genital opening.

Gnathosoma. The four-segmented palpi (fig. 4) are longer than the chelicerae. The palpal tarsus is  $25\mu$  long and provided with a strong terminal spine and five additional setae.

Legs. All the legs are shorter than the body and terminate in two slender curved claws between which a haired empodium is located. Tarsus I is irregular in outline and dorsally provided with a sensory spine. The legs are sparsely covered with setae.

Male. The male is similar to the female except for the genital opening (fig. 5) which is smaller in the former.

Habitat and locality. One holotype and seven paratype females and one allotype male from Pelargonium sp., Grabouw, November 1953; one paratype male from Phaseolus vulgaris, Potchefstroom, December 1953; two paratype females from

Ficus.....

Ficus.....

Ficus carica, Grabouw and one from Rivier Zonder End, January 1955; two paratype females from Populus canescens, Stellenbosch, January 1955; two paratype males from Daucus carota, Caledon, December 1954; one paratype female from Viola odorata, Potchefstroom, December 1954; one paratype female from Canna indica, Grabouw; two paratype females from Cucurbita pepo, Grabouw; four paratype females from Vitis sp., Buxtom, January 1956; one paratype female from ~~Zantedeschia aethiopica~~ Grabouw, December 1954; one paratype female from Cydonia vulgaris, Grahamstown, January 1955; one paratype female from Carica papaya, Munster, April 1955; two paratype females from Saccharum officinarum, Grabouw, January 1955; three paratype females from Prunus domestica, Grabouw, December 1953; two paratype females from Solanum tuberosum, Potchefstroom, December 1954; one paratype female from Prunus armeniaca, Grabouw, December 1953.

Tydeus munsteri, n.sp.

(Figs. H 6-8)

The absence of eyes and the lanceolate dorsal setae of this species resemble those of T. sampsoni Baker but it differs from the latter by the absence of a dorsal suture and the chaetotactic pattern formed by the setae verticales externae and the setae scapulares externae.

Female (fig. 6)

Dimensions: Length of body (excluding gnathosoma) 238 $\mu$ ; length (including gnathosoma) 258 $\mu$ ; breadth of body 164 $\mu$ ; length of leg I 107 $\mu$ , leg II 77 $\mu$ , leg III 86 $\mu$ , leg IV 90 $\mu$ . The body is oval-shaped.

Dorsum. The suture between the propodosoma and the hysterosoma is absent. The skin is provided with punctated striations which are mostly straight and longitudinal on the propodosoma, tortuous in the median region of the hysterosoma and transverse posteriorly. Judging from the figure of T. sampsoni given by Baker (1946) this species can be distinguished from T. munsteri by the setae verticales externae which are situated further away from the sensory setae ( $31\mu$ ) and by the setae scapulares externae which are placed lateral to the sensory setae and not posterior to it as is the case in the latter species. The hysterosoma bears nine pairs of setae. As in T. sampsoni all the dorsal setae (fig. 7) are lanceolate, each being approximately  $16\mu$  long. The eyes are absent.

Venter. The genital opening is similar to that of T. grabouwi.

Gnathosoma. The palpus (fig. 8) is of medium length, the end of the third segment being more or less in a line with the tip of the chelicera. The slender palpal tarsus ( $22\mu$ ) bears a terminal spine and four additional setae. The chelicerae are normal for the family.

Legs. The legs are sparsely covered with setae and each terminates in two claws and a haired empodium. A short rod-like sensory organ is present on tarsus I.

Male. Similar to the female. The genital opening resembles that of T. grabouwi.

Habitat and locality. One holotype and one paratype female and one allotype male from an unidentified wild shrub, Munster, April 1955; two paratype females from Citrus limonia, Munster, April 1955; one paratype male from Erythrina caffra, Munster, April 1955; one paratype female from Psidium guayawa, Munster, April 1955.

Tydeus eriophyes, n.sp.

(Figs. H 9-11)

This species differs from the other species of Tydeus by the presence of bluntly pointed rod-like dorsal setae and the absence of eyes.

Dimensions: Length of body (excluding gnathosoma) 225  $\mu$ ; length (including gnathosoma) 285  $\mu$ ; breadth of body 131  $\mu$ . The body is oval-shaped.

Dorsum (fig. 9). The suture between the propodosoma and the hysterosoma is present. The skin is provided with punctated striations, those on the propodosoma being mostly straight and longitudinal while those on the hysterosoma are tortuous. The usual pair of sensory setae and three pairs of ordinary setae are borne on the propodosoma. The hysterosoma bears nine pairs of setae. The dorsal setae (fig. 10), each measuring 20  $\mu$ , are rod-like and blunt at their apices. Eyes are absent.

Venter. The genital opening could not be observed. The specimen examined probably is a nymph but owing to the fact that it was over-cleared this could not be determined with certainty.

Gnathosoma. The tarsus of the four-segmented palpus (fig. 11) is long (20  $\mu$ ) and narrow. Three apical setae and one lateral seta are borne on this segment.

Legs. All the legs are shorter than the body. Two claws and a haired empodium are present on each tarsus. Tarsus I is provided with a small sensory spine.

Habitat and locality. One holotype and one paratype specimen, found associated with Eriophyes vitis, from Vitis sp., Grañou, December 1954.

Genus PRONEMATUS Can., 1836

Pronematus can easily be separated from the genus Tydeus by the absence of claws and empodia on the first pair of legs. These structures are replaced by four or five setae.

Pronematus pruni, n.sp.

(Fig. #12)

This species appears to be closely related to P. vandykei Baker but differs in the relatively shorter distal setae on tarsus I, the shorter dorsal setae and the presence of eight instead of ten pairs of hysterosomal setae. The sex of these specimens could not be determined.

Dimensions: Length of body (excluding gnathosoma) 263  $\mu$ ; length (including gnathosoma) 319  $\mu$ ; breadth of body 169  $\mu$ .

Dorsum. The propodosoma is separated from the hysterosoma by a suture. The former is provided with one pair of sensory setae (about 30  $\mu$  long) and three pairs of ordinary setae (about 21-23  $\mu$  long). Posteriorly the hysterosoma is segmented by an inconspicuous transverse suture. A suture similar to the one in P. vandykei, which runs posterior to the third pair of median hysterosomal setae, could not be seen. The hysterosoma bears eight pairs of setae of which the lateral posterior pair measure about 40  $\mu$ ; the others measure 20-23  $\mu$ . All the dorsal setae are inconspicuously setose. Eyes are absent.

Gnathosoma. The palpal tarsus is provided with four distal setae. The chelicerae are normal for the genus.

Legs. All the legs are much shorter than the body. Leg I is devoid of claws and the tarsus (25  $\mu$ ) ends in four setae, the longer pair of which measure 42  $\mu$  and the shorter pair 22  $\mu$ . The proximal half of this segment bears a relatively long seta. Tibia I measures 17  $\mu$ . The other three <sup>pairs of</sup> legs are each provided with two claws and a haired empodium.

Habitat and locality. One holotype from Prunus domestica, Potchefstroom, Dec. 1954; one paratype from Psidium guayawa, Stellenbosch, January 1955.

SUBCOHORS STOMATOSTIGMATA OUDEMANS, 1906

These heavily sclerotized mites are provided with few body setae; the propodosoma bears four pseudostigmatic sensory setae, a pair of lens-like eyes laterally, and, in some forms, an additional large lens-like lateral organ; the genital and anal openings are covered by plates and two pairs of genital suckers; the palpi are simple; the strong chelicerae are provided with opposed chelae; the legs are characteristic, the coxae forming distinct ventral plates. All the tarsi are provided with two claws and tarsi II, III, and IV each have claw-like empodia; both tarsus I and tibia I are covered with tactile setae and dorsally tarsus I may have a single striated rod-like sensory seta as well as a specialized branched seta (famulus); a slender rod-like sensory seta is present on tibia I.

SUPERFAMILY LABIDOSTOMMOIDEA EWING, 1934

The characteristics of the subcohors can be applied here. This superfamily contains a single family, the Labidostommidae.

FAMILY LABIDOSTOMMIDAE OUDEMANS, 1904

These egg-shaped free-living predators are completely armored. The posterior portion of the propodosoma merges into the hysterosoma without a clear line of demarcation. One pair of sensory setae and one lens-like eye are present on each side of the propodosoma; in certain species the middle portion of the anterior margin of the propodosoma is provided with an additional unpaired eye. A large lens-like organ may be located on the lateral margin behind each normal eye. The palpus is four-segmented and the chelicerae are provided with large, strong, opposed chelae. The coxal plates are contiguous.

All.....

All.....

All the tarsi are provided with two claws and tarsi II, III and IV each has a claw-like empodium. Two pairs of genital suckers are present. In the female the genital and anal openings are united within a circular plate; the genital opening of the male is separate from the anus.

Genus LABIDOSTOMMA Kramer, 1879

The separation of the genera Nicolettiella and Labidostomma was based primarily on the presence or absence of antero-lateral projections of the dorsum. Greenberg (1952) doubts the desirability of such a taxonomic division on account of the existence of a transitional group represented by such species as L. absoloni (Willmann) and L. longipes Willmann. According to this author little evidence exists that this structure is correlated with other morphological differences. Greenberg therefore follows the practice of Grandjean (1942) and Baker & Wharton (1952) in synonymizing Nicolettiella with Labidostomma.

The characteristics of this genus are the following: The integument is usually provided with a reticulated pattern. The fixed digit of the chelicera usually bears teeth. The two lateral rows of tubercles, which are characteristic of Eunicolina, are absent.

Key to the South African species of the genus Labidostomma

1. Entire dorsum covered with reticulated pattern; movable chela with two relatively large and five small teeth; length of body (excluding gnathosoma) 676  $\mu$ ; length (including gnathosoma) 877  $\mu$ ; breadth 524  $\mu$ .....L. aethiopica, n.sp.

--. Greater part of dorsum punctated or finely striated; anterior third with reticulated pattern; length of body (excluding gnathosoma) 570  $\mu$ ; breadth 340  $\mu$ ....L. höegi Thor.

Labidostomma aethiopica, n.sp.

(Figs. I 1-5)

In addition to details in the integumental pattern which serve in distinguishing this species from closely related forms, it may further be recognised by the presence of two relatively large and five smaller teeth on the movable chela of the chelicera.

Female

Dimensions: Length of body (excluding gnathosoma) 676  $\mu$ ; length (including gnathosoma) 877  $\mu$ ; breadth of body 524  $\mu$ . The body is egg-shaped.

Dorsum (fig. 1). As in other members of the genus the integument is provided with a reticulated pattern which consists of polygonal elements. The pattern is rather faint and inconspicuous in the posterior region of the dorsum. Two pairs of branched sensory setae are present, the anterior pair measuring approximately 104  $\mu$  and the posterior pair about 116  $\mu$ . The pair of setae lateral to the anterior pair of sensory setae each measures 100  $\mu$ . The remainder of the dorsum bears about thirteen pairs of setae. All the dorsal setae (with an average length of approximately 56  $\mu$ ) are simple. A median eye and a pair of lateral eyes are present. Laterally a large lenslike organ is situated behind the eyes.

Venter. (fig. 2). The venter is also provided with a reticulated pattern. The coxal plates are contiguous and provided with a number of setae. The genital and anal openings are united within a circular plate. The genital plates are each provided with about sixteen setae while the anal plate bear two setae.



Gnathosoma. The four-segmented palpus (fig. 3) is relatively short. The palpal tarsus is provided with five relatively long setae. As in L. luteum Kramer the movable chela of the chelicera (fig. 4) is provided with seven teeth. In L. aethiopica, however, the two proximal teeth are relatively large whereas the other five teeth are small and diminishing in size distally. The tip of the fixed chela is bilobed. With the exception of the proximal portion, which is striated, the integument of the cheliceral base has the characteristic reticulated pattern. The proximal cheliceral seta is mounted on a tubercle.

Legs. All the legs are shorter than the body. Tarsus I is provided with two sensillae and a number of relatively long setae. All the tarsi are provided with two claws, tarsi II, III and IV also bearing a claw-like empodium.

Male. Similar to the female except for the genital and anal openings (fig. 5) which are separated. The genital plates are each provided with ten setae and the anal plates each bear three setae.

Habitat and locality. One holotype female, one paratype female and one allotype male from grass and soil, Bathurst, June 1958. Collected by P. Graham.

#### Labidostomma hœegi Thor, 1931

Labidostomma hœegi can be distinguished from the related species in that the dorsal integument is for the greater part punctated or finely striated; only the anterior third of the dorsum is provided with a reticulated pattern. The ventral side is also punctated except for the area lateral to the coxal plates as well as two thirds of the first coxal plate. The chelicerae are 83  $\mu$  long. Length of body (excluding gnathosoma) 570  $\mu$ ; breadth 340  $\mu$ .

Thor (1931c) described this species from a specimen, collected by Ove Hœeg, from moss, Port Elizabeth.

## COHORS PARASITENGINA OUDEMANS, 1909

These large red mites have a well-developed palpal thumb-claw complex; the propodosoma is usually provided with a specialized sclerotic area, on which sensory setae are located; the body is densely clothed with short setae which are not arranged into transverse rows; the legs bear many setae, some of which may have a sensory function; the tarsi of all the legs terminate in tarsal claws; the empodium is rarely present; the larvae are heteromorphic.

## SUPERFAMILY ERYTHRAEOIDEA GRANDJEAN, 1947

The members of this superfamily are provided with a well-developed palpal thumb-claw complex; the movable chelae are strong, long, straight and needle-like; the propodosoma is provided with sclerotized sensory areas on which sensory setae are located; the body is densely clothed with short setae; genital suckers may be present or absent; all the segments of the legs bear many tactile setae; tarsi and tibiae I have many striated sensory setae which are scattered among these tactile setae; tarsal claws are present but the empodia are absent.

This superfamily comprises the Erythraeidae Oudemans, 1902, Smaridiidae Kramer, 1878 and Calyptostomidae Oudemans, 1923.

## FAMILY ERYTHRAEIDAE OUDEMANS, 1902

The adults of this family are reddish, free-living predators; the larvae are parasitic on arthropods. Their legs are adapted for running. The body is oval-shaped and clothed with a large number of setae. The propodosoma is provided with a median longitudinal *crista metopica* (Vitzthum lists Fallopia and Neosmaris as exceptions). There are two sensory areas on the *crista*; the anterior one is often far in front on a *nasus* and  
the.....

the.....

the posterior one is usually placed near the posterior margin of the crista. Two sensory setae are situated on each sensory area. In forms where the crista is absent, the sensory setae are located in the corresponding position. Either one or two pairs of eyes are present. Coxae I & II and III & IV are arranged into two groups. Two claws are present on each tarsus but an empodium is absent. The tibia of the five-segmented palpus is provided with a strong claw. The chelicerae are unsegmented, stylet-like, very long, capable of being withdrawn into the body and usually toothed in their distal portions. Genital suckers are absent.

Key to the South African genera and species of the family Erythraeidae associated with plants

1. Two eyes on each side; legs I and IV often very long....  
.....Erythraeus Latreille

a. Anteriorly, crista with a nasus which is without setae; anterior sensory area with seven setae; dorsal body setae of two lengths, the shortest 80-127  $\mu$ , the longest 150-200  $\mu$ ; length of body (excluding gnathosoma) 1100  $\mu$ ; length (including gnathosoma) 1500  $\mu$ ; breadth 934  $\mu$ ; length of leg I 2430  $\mu$ , leg IV 2350  $\mu$ .....E. munsteri, n.sp.

--. Usually with one eye on each side; legs I and IV not very long.....2

2. Eyes placed behind the middle of the crista...Balaustium  
V. Heyden

a. Crista with a plate; anterior sensory area of crista with two setae in front of sensory setae; length of body.....

body.....

body (excluding gnathosoma) 633  $\mu$ ; length (including gnathosoma) 840  $\mu$ ; breadth 322  $\mu$ .....B. bipilum, n.sp.

---. Crista without a plate.....b

b. One eye on each side.....c

---. Two eyes on each side.....d

c. Anterior portion of crista distinctly pointed, with one seta in front of sensory setae; dorsal setose setae 28  $\mu$  long; first pair of legs longer than the body; length of body (excluding gnathosoma) 863  $\mu$ ; length (including gnathosoma) 1052  $\mu$ ; breadth 600  $\mu$ .....B. vignae, n.sp.

---. Anterior portion of crista rounded in front and with only two sensory setae; dorsal plumose setae 36-55  $\mu$  long; first pair of legs slightly longer than the body; length of body (excluding gnathosoma) 1310  $\mu$ ; length (including gnathosoma) 1592  $\mu$ ; breadth 853  $\mu$ .....E. medicagoense, n.sp.

d. Anterior sensory area with one seta in front of sensory setae; posterior sensory area rounded; length of dorsal feathered setae 31  $\mu$ ; length of body of nymph (excluding gnathosoma) 572  $\mu$ ; length (including gnathosoma) 722  $\mu$ ; breadth 420  $\mu$ .....B. cristatum, n.sp.

---. Anterior sensory area with only two sensory setae; posterior sensory area stretching backwards, terminating in a sharp point; length of dorsal plumose setae 22  $\mu$ ; length of body of nymph

(excluding.....)

(excluding.....)

(excluding gnathosoma) 572  $\mu$ ; length (including gnathosoma) 722  $\mu$ ; breadth 420  $\mu$ ....B.graminum, n.sp.

--. Eyes placed in front of middle of crista.....  
.....Leptus Latreille

a. Anterior and posterior sensory areas placed normally; anterior sensory area with nine setae in front of sensory setae; length of body (excluding gnathosoma) 1320  $\mu$ ; length (including gnathosoma) 1720  $\mu$ ; breadth 1000  $\mu$ ....L.intermedius, n.sp.

Genus ERYTHRAEUS Latreille, 1806

The characteristics of this genus are the following; Legs I and IV are often longer than the body; two pairs of eyes are present on each side of the body; the dorsal setae are not modified into an imbricate scaling; the palpi are simple and are without spines ventro-distally. The legs are devoid of highly modified serrate setae.

The larval characters of this genus are the following: Two eyes are present on each side; the dorsal plate is generally rounded, flattened or concave anteriorly and provided with two pairs of sensory setae of which the anterior pair ~~are~~<sup>is</sup> situated a little behind the anterior border of the plate, the posterior pair being situated on the posterior border of the plate. The plate also bears two or three pairs of non-sensory setae, one or two pairs being placed anteriorly near the edge of the plate; the posterior pair ~~are~~<sup>is</sup> situated approximately in the middle of the plate near the edge. The tarsi are provided with strong falciform empodia and two lateral dissimilar modified claws;.....

claws;.....

claws; the anterior claw is ciliated and has a weak terminal hook and the posterior claw is retroflexed.

Erythraeus munsteri, n.sp.

(Figs. J 1-5)

This species is distinguished from the other species of Erythraeus on the basis of the relative length of the dorsal setae and certain features of the crista. It resembles E. celeripes (Rainbow), E. imperator (Hirst) and E. collinitus Lawrence, in the fact that the dorsal setae are of two distinct sizes and that the crista is drawn out into a snout-like process (nasus).

Female (fig. 1)

Dimensions: Length of body (excluding gnathosoma) 1100  $\mu$ ; length (including gnathosoma) 1500  $\mu$ ; breadth of body 934  $\mu$ ; length of leg I 2430  $\mu$ , leg II 1330  $\mu$ ; leg III 1510  $\mu$ , leg IV 2350  $\mu$ . The body is oval-shaped. The colour is red.

Dorsum. The dorsal surface of the body is provided with numerous, but well separated, blackish setose setae of irregular lengths, the longer setae measuring 150-200  $\mu$  and the shorter setae 80-127  $\mu$ . The crista (fig.4) is linear, the anterior portion being produced into a nasus, which, unlike the condition in E. imperator and E. collinitus is devoid of setae. Two sensory setae (169  $\mu$  long and setose) and seven ordinary setose setae, of which those on the anterior portion are the longest (307  $\mu$ ), are situated on the anterior sensory area of the crista. The posterior sensory area of the crista is rounded and carries two sensory setae each measuring 222  $\mu$ . Two eyes are present on each side of the body.

Gnathosoma. Except for a single small basal tooth the claw on the palpal tibia is smooth ventrally. All the palpal segments (fig. 5) are covered with relatively long setose setae. The palpal tarsus is more or less oval-shaped and covered with a number of spine-like setae. The chelicerae are long and stylet-like.

Legs. The legs are long and slender. Tibiae I & III are about two and a quarter times the length of tarsi I & III; tarsus I is approximately two and a half times as long as broad; tibia II is about one and three quarters as long as tarsus I; tibia IV is about three and a quarter times as long as tarsus I. All the segments of the legs are thickly covered with relatively long as well as short setose setae. Each of the tarsi is provided with two claws.

Habitat and locality. The holotype from an unidentified climbing-plant, Munster, April 1955; one paratype specimen collected by P. Graham from grass and soil, Bathurst, January 1956.

Genus BALAUSTIUM V. Heyden, 1826

The genus Balaustium may be characterised by the following: One or two pairs of eyes are present and placed behind the middle of the crista; the latter may be provided with a plate; the anterior sensory area may project over the rostrum in a sort of nasus. The dorsal setae are simple or plumose.

Balaustium vignae, n.sp.

(Figs. J 6-9)

The crista of this species resembles that of B. tardum  
(Halbert).....

(Halbert)....

(Halbert) but differs from those of the other species of Balaustium. The fact that the first pair of legs are longer than the body and that the dorsal setae are more setose than those of B. tardum, distinguishes B. vignai from this related species.

Female (fig. 6)

Dimensions: Length of body (excluding gnathosoma) 863  $\mu$ ; length (including gnathosoma) 1052  $\mu$ ; breadth of body 600  $\mu$ . This species is orange-coloured and oval-shaped.

Dorsum. It differs from B. tardum in the fact that the suture between the propodosoma and hysterosoma is absent. The body is covered with numerous setose setae (fig. 7) which are approximately 28  $\mu$  long. The setal covering is of medium density. The long, slender crista (fig. 8) has two sensory areas each bearing a pair of sensory setae; the anterior pair measure 54  $\mu$  and the posterior pair 61  $\mu$ . As in B. tardum the anterior portion of the crista is distinctly pointed and there is only one seta in front of the sensory setae. One eye is situated near the posterior half of the crista.

Gnathosoma. The palpal tibia has a strong claw which extends a short distance beyond the palpal tarsus (fig. 9). The inner margin of the claw is provided with a small tooth proximally. The palpal tarsus is approximately 29  $\mu$  long and 22  $\mu$  broad and distally it is clothed with numerous stiff setae, the longest of which are situated on the lateral margin nearest to the tibial claw.

Legs. The first pair of legs ~~are~~<sup>is</sup> longer than the body, those of B. tardum being considerably shorter. All the segments of the legs are covered with numerous setae. Each tarsus bears two claws. Tarsus I is 146  $\mu$  long and 57  $\mu$  broad.



Nympha.

Dimensions: Length of body (excluding gnathosoma) 377  $\mu$ ; length (including gnathosoma) 500  $\mu$ ; breadth of body 275  $\mu$ ; length of leg I 480  $\mu$ , leg II 282  $\mu$ , leg III 325  $\mu$ , leg IV 460  $\mu$ .

The nymph is similar to the female except for the dorsal setae which are shorter (22-24  $\mu$ ) and the posterior portion of the crista which is weakly developed.

Habitat and locality. One holotype female from Vigna faba, Kaap Muiden, April 1955; one morphotype nymph from grass, Potchefstroom, April 1958.

Balaustium medicagoense, n.sp.

(Figs. J 10-14)

This species probably is related to B. insularum Womersley but differs from it in the structure of the dorsal setae and the crista which is without a plate. The crista also separates B. medicagoense from other species in this genus.

Female (fig. 10)

Dimensions: Length of body (excluding gnathosoma) 1310  $\mu$ ; length (including gnathosoma) 1592  $\mu$ ; breadth of body 853  $\mu$ . The body is large and oval-shaped.

Dorsum. The suture between the propodosoma and hysterosoma is absent. The dorsum is thickly covered with plumose setae (fig. 11). The dorsal setae are stouter than those of B. insularum and blunt apically. The lengths of the dorsal setae are variable (36-55  $\mu$ ). The crista (fig. 12) is well-developed and devoid of a plate. Each of the anterior and posterior sensory areas of the crista is provided with two sensory setae of which the anterior pair measures 71  $\mu$  and the posterior pair 100  $\mu$ . As in B. insularum the anterior area

is.....

is.....

is rounded in front but unlike the latter the posterior area extends backwards and terminates in a sharp point. One eye, on each side, is situated near the posterior half of the crista.

Venter. The genital area is provided with numerous setae.

Gnathosoma. The tibia of the five-segmented palp (fig. 13) bears a strong claw which extends beyond the palpal tarsus (36  $\mu$  long and 11  $\mu$  broad). The latter bears about ten short setae. The inner margin of the tibial claw has a small proximal tooth.

Legs. The first pair of legs ~~are~~<sup>is</sup> slightly longer than the body. Tarsus I is 135  $\mu$  long and 71  $\mu$  broad. Each tarsus terminates in two claws.

Nympha (fig. 14)

Dimensions: Length of body (excluding gnathosoma) 776  $\mu$ ; length (including gnathosoma) 1050  $\mu$ ; breadth of body 537  $\mu$ . The dorsal aspect of the nymph is similar to that of the female except for the crista which is not yet fully developed.

Habitat and locality. One holotype female, two paratype females and one morphotype from Medicago sativa and Trifolium sp., Caledon, July 1955. Collected by J. Fick. One paratype female from Pirus malus, Grabouw, January 1954; one paratype female from Prunus persica, Caledon, December 1954.

Balaustium bipilum, n.sp.

(Figs. J 15-19)

This species is related to Balaustium angustum Evans and B. lapidarium Willmann but it can easily be distinguished

from.....

from.....

from them by the presence of two setae, instead of three, in front of the sensory setae on the anterior portion of the crista.

Female (fig. 15)

Dimensions: Length of body (excluding gnathosoma) 633  $\mu$ ; length (including gnathosoma) 840  $\mu$ ; breadth of body 322  $\mu$ ; length of leg I 500  $\mu$ , leg II 336  $\mu$ , leg III 326  $\mu$ , leg IV 424  $\mu$ . This orange coloured mite is long oval-shaped.

Dorsum. Anteriorly, the propodosoma narrows down and posteriorly it is clearly separated from the hysterosoma. The crista (fig. 16) is provided with two sensory areas each bearing two sensory setae of which those in front measure 60  $\mu$  and those behind them 65  $\mu$ . As in B. angustum the anterior sensory area projects beyond the margin of the body and is rounded in front. In addition to the sensory setae the anterior portion of the crista bears two setae. The posterior area reaches backwards and terminates in a sharp point. As in B. lapidarium the crista is placed on a plate which, in this case, is narrow and elongated. One eye is present on each side of the body near the posterior half of the crista. The propodosoma as well as the hysterosoma are covered with a number of simple setae (fig. 17) each measuring 25  $\mu$ .

Venter. On the ventral side the slit-like genital opening (fig. 18) is flanked by approximately sixteen setae.

Gnathosoma. The five-segmented palp (fig. 19) is sparsely covered with setae. The tibia is provided with a strong claw which does not extend beyond the palpal tarsus (24  $\mu$  long and 11  $\mu$  broad). The palpal tarsus bears approximately ten spine-like setae.

Legs. Tarsus I is 100  $\mu$  long and 42  $\mu$  broad. Two claws are present on each tarsus.

Nympha. Essentially similar to the female.

Habitat and locality. One holotype female and one paratype from grass, Potchefstroom, April 1958; one morphotype nymph from Medicago sativa, Potchefstroom, April 1954; one paratype female from grass, Boskop, June 1958; one paratype female from grass and soil, Bathurst, June 1956.

Balaustium cristatum, n.sp.

(Figs. J 20-25)

In addition to the presence of two eyes on each side of the body the dorsal chaetotaxy of B. cristatum also resembles that of B. madeirense Willmann. The details of the crista of the two species, however, easily separates these two species.

Nympha (fig. 20)

Dimensions: Length of body (excluding gnathosoma) 572  $\mu$ ; length (including gnathosoma) 722  $\mu$ ; breadth of body 420  $\mu$ . The body is oval-shaped.

Dorsum. There is no division between the propodosoma and the hysterosoma. The dorsum is covered with numerous feathered setae (31  $\mu$ ) (fig. 21). The setal covering is of medium density. The crista (fig. 22) has two sensory areas, the anterior area being semi-circular and carrying two sensory setae (47  $\mu$ ) and one additional seta; the posterior area is rounded and bears two sensory setae, each having a length of 41  $\mu$ . Two eyes are present on each side near the posterior half of the crista.

Gnathosoma. The palpi (fig. 23) are five-segmented and sparsely covered with setose setae. The palpal tibia bears a  
strong.....

strong.....

strong claw which extends a short distance beyond the palpal tarsus. The latter bears about seven setae and is 18  $\mu$  long and 10  $\mu$  broad.

Legs. All the legs are shorter than the body. Each of the tarsi terminates in two claws. Tarsus I is 49  $\mu$  long and 18  $\mu$  broad.

Larva (fig. 24)

Dimensions: Length of body (excluding gnathosoma) 400  $\mu$ ; length (including gnathosoma) 550  $\mu$ ; breadth of body 282  $\mu$ .

The body is oval-shaped and dorsally covered with a number of setose setae (42  $\mu$ ). The crista is not yet developed and is represented by an anterior and posterior sensory area, each provided with two sensory setae.

The palpi (fig. 25) are short and thick. The short palpal tarsus bears a distal spine and four setae. The first and second pairs of legs are shorter than the body but the third pair ~~are~~<sup>is</sup> longer.

Habitat and locality. One holotype nymph and one morphotype larva from weeds, Malelane, April 1955.

Balaustium graminum, n.sp.

(Figs. J 26-29)

Balaustium graminum and B. medicagoense appears to be closely related, the most conspicuous distinguishing characters being the density of the dorsal setae and the presence of two eyes on each side of the body of the former species.

Nympha (fig. 26)

Dimensions: Length of body (excluding gnathosoma) 800  $\mu$ ; length (including gnathosoma) 940  $\mu$ ; breadth of body 545  $\mu$ . The body is oval-shaped.

Dorsum. The suture between the propodosoma and hysterosoma is absent. The dorsum is covered with plumose setae (fig. 27) each measuring 22  $\mu$ . The setal covering is not as dense as in B. medicagoense. The crista (fig. 28) resembles that of B. medicagoense and as in the latter the posterior sensory area is continued posteriorly, terminating in a sharp point; the anterior area is rounded in front. Two sensory setae are borne on each, the anterior pair measuring 37  $\mu$  and the posterior pair 61  $\mu$ . Two eyes are situated on each side in a line with the posterior half of the crista.

Gnathosoma. The five-segmented palpi (fig. 29) are sparsely covered with setae. The tibia bears a strong claw which extends for a short distance beyond the palpal tarsus. Seven setae are borne on the palpal tarsus.

Legs. All the legs are shorter than the body. Two claws are present on each tarsus. Tarsus I is 89  $\mu$  long and 50  $\mu$  broad.

Habitat and locality. One holotype nympha from grass, Grabouw, January 1954.

Genus LEPTUS Latreille, 1795

This genus can be distinguished from Balaustium by the position of the eyes which are placed in front of the middle of the crista, the latter structure usually being without any plate; the nasus is absent; the dorsal setae are thick and feathered.

Leptus intermedius, n.sp.

(Figs. J 30-33)

As regards the crista and the dorsal setae this species resembles most closely L. berlesei Oudemans. It is, however, most readily distinguished from this species as well as the other members of the genus, except L. clavatus Willmann, ~~by means~~ <sup>because</sup> of the fact that the anterior sensory area is provided with nine instead of four setae in front of the sensory setae. It differs from L. clavatus in having a crista which is not surrounded by a broad plate.

Dimensions: Length of body (excluding gnathosoma) 1320  $\mu$ ; length (including gnathosoma) 1720  $\mu$ ; breadth of body 1000  $\mu$ . This mite is oval-shaped.

Dorsum (fig. 30). The dorsum is provided with a dense clothing of dark plumose setae (fig. 31) each measuring 25-44  $\mu$ . As in L. ornatus Womersley there appears to be a medial patch where the dorsal setae are light; in this case a similar patch also appears posteriorly. The crista (fig. 32) is slender and approximately 558  $\mu$  long. The anterior sensory area is elliptical in shape and about two times longer than broad. Nine straight plumose setae, longer and lighter than those surrounding the area, are present in front of the two setose sensory setae (68  $\mu$ ). The posterior sensory area is more rounded than the anterior one and is provided with two sensory setae (72  $\mu$  long). The former area is continued posteriorly and terminates in a sharp point. One eye is situated on both sides of the posterior half of the crista.

Gnathosoma. The five-segmented palpi (fig. 33) are densely covered with plumose setae. The tibia is provided with a claw reaching past the middle of the palpal tarsus.

Legs. As in L. vertiformis Trägårdh the first pair of legs are about as long as the body. The fourth pair of legs are longer than the body and have swollen femurs and genus. All the segments  
of.....

of.....

of the legs are thickly covered with setae. Two claws are present on each tarsus.

Habitat and locality. One holotype and one paratype specimen from grass and soil, Bathurst, January 1956. Collected by P. Graham.

FAMILY SMARIDIIDAE KRAMER, 1878

Southcott (1946) separated this family into four subfamilies namely Smaridiinae, Fessoniinae, Hirstiosominae and Phanolophinae. Baker & Whanton, however, whose arrangement is followed here, assigned seven genera to the family --- without subfamilies.

These predacious mites have long oval-shaped bodies which are pointed anteriorly and provided with moderate shoulders. The propodosoma is usually drawn out into a long "nose". Two sensillary areas, each provided with a pair of sensory setae, are located on the dorsum. The crista metopica may be either present or absent. One or two eyes are situated on each side of the propodosoma. The setae have a peculiar structure; they are usually foliolated serrated. Coxae I and II, and III and IV are united but the two groups are separated. The legs are slender and sometimes extremely long. Two claws are present on each of the tarsi. Empodia are absent. The five-segmented palpus is provided with a thumb-claw complex. The chelicerae are long and stylet-like. The gnathosoma may either be withdrawn into the body or may project far anteriorly. The larvae are also provided with a plate which bears two pairs of sensory setae and two pairs of ordinary setae.



Key to the South African genera and species of the family  
Smaridiidae

1. Dorsal and ventral plates present; without crista.....  
.....Smaris Latreille
- a. Posterior dorsal plate absent; dorsal setae leaf-like and about 22  $\mu$  long; anterior ventral plate rounded posteriorly; length of body (excluding gnathosoma) 915  $\mu$ ; length (including gnathosoma) 1062  $\mu$ ; breadth 490  $\mu$ .....S. biscutatus, n.sp.
- . Dorsal and ventral plates absent; with a crista which is produced forward onto the nasus.....Fessonnia Von Heyden
- a. Posterior sensillary area not located on the crista but situated approximately 391  $\mu$  from the posterior end of the crista on which the anterior sensillary area is located; length of body (excluding gnathosoma) 635  $\mu$ ; length (including gnathosoma) 962  $\mu$ ; breadth 361  $\mu$ .....F. brevicristata, n.sp.

Genus SMARIS Latreille, 1796

The members of this genus can be identified by the following characteristics: The crista is absent; two sensillary areas, each provided with paired sensory setae, are placed posterior to the paired eyes; dorsal and ventral plates are present, the anterior dorsal plate is produced into a nasus.

Smaris biscutatus, n.sp.

(Figs. J 34-40)

This species differs from the other species of Smaris by the absence of the posterior dorsal plate. The shape of the anterior dorsal plate resembles that of Smaris prominens (Banks).

Female (fig. 34)

Dimensions: Length of body (excluding gnathosoma) 915  $\mu$ ; length (including gnathosoma) 1062  $\mu$ ; breadth of body 490  $\mu$ . The body is oval in outline and provided with rather prominent shoulders.

Dorsum. Only an anterior pear-shaped dorsal plate could be observed. The apex of this plate forms the nasus. A pair of eyes are situated on each side of the plate in a line with the second pair of legs. Behind the eyes in the midline, there is a sensillary area (fig. 35) with a pair of sensory setae each measuring about 70  $\mu$ . The posterior margin of the plate is provided with a second sensillary area (fig. 36) and the pair of sensory setae are approximately 45  $\mu$  long. The two pairs of small subcuticular muscular plates which are placed between the anterior and posterior plates in S. prominens, could not be observed in the present species.

The dorsum is densely clothed with leaf-like setae (fig. 37) which measure 22  $\mu$ . As in S. prominens these setae are rather flattened ventrally, broadly convex dorsally and provided with longitudinal rows of serrations.

Venter (fig. 39). The anterior coxae are placed on a large plate which is rounded behind. In this respect it differs from S. prominens in which this plate is somewhat triangular in shape. As in S. prominens the posterior coxae are placed on triangular lateral plates. The entire venter is densely covered with setae of the same kind as those of the dorsum. The genital opening (fig. 39) is slit-like; the lips are furnished with approximately twenty pairs of simple setae, and outside these lips the cuticle forms a pair of outer ridges which are provided with the normal leaf-like setae.

Gnathosoma. The tarsus of the palp (fig. 40) is shorter than the strongly curved claw and is furnished with a number of setae.

Legs. All the legs are shorter than the body and are densely clothed with setae. The legs each terminates in two claws.

Habitat and locality. One holotype female and one paratype female from grass and soil, Bathurst, January 1956. Collected by P. Graham.

Genus FESSONIA Von Heyden, 1826

The crista of this genus is continued for some distance beyond the anterior sensillary area onto the nasus where it expands to form an area which resembles a sensillary area but lacking any sensory setae. The posterior sensillary area is usually ~~is~~ placed on the crista (except in F. brevicristata, n. sp.) Dorsal and ventral plates are absent. Two eyes are present on each side, just anterior to the anterior sensillary area.

Fessonia brevicristata, n. sp.

(Figs. J 41-44)

The present species differs from Fessonia papillosa (Herrn.) and F. australiensis Southcott, the only known species of this genus, ~~by~~ the fact that the crista does not extend posteriorly to the anterior sensillary area with the result that the posterior sensillary area is not located on the crista.

Female (fig. 41)

Dimensions: Length of body (excluding gnathosoma) 635  $\mu$ ; length (including gnathosoma) 962  $\mu$ ; breadth of body 361  $\mu$ . The body is more or less oval-shaped and narrowed posteriorly.

Dorsum. The body is thickly covered with brown foliolated setae (25  $\mu$ ) (fig. 42) which are convex in dorsal view and provided with longitudinal rows of serrations. The crista (fig. 43) is linear and measures 242  $\mu$ ; the anterior sensillary area is situated on the posterior end of the crista and bears a pair of sensory setae, each measuring 84  $\mu$ ; the anterior sensillary area is also provided with an additional normal dorsal seta. Anteriorly the crista expands to form an area which resembles the sensillary areas but which is devoid of sensory setae, being provided with normal body setae instead. The distance between the posterior sensillary area (fig. 44) and the anterior one is 391  $\mu$ ; the pair of sensory setae each measure 125  $\mu$ . Two eyes are present on each side immediately anterior to the anterior sensillary area; the anterior eye is the larger and situated more medially.

Venter. The entire venter is densely clothed with setae similar to those of the dorsum. The genital opening is flanked by a number of simple setae.

Gnathosoma. The palpi (fig. 45) are slender and sparsely covered with simple setae. The palpal tibia bears a claw which is slightly shorter than the palpal tarsus. The latter is provided with six setae.

Legs. Both the first and fourth pairs of legs are longer than the body, legs IV being shorter than legs I. The segments of all the legs are densely covered with setae of the normal type. Each tarsus bears two claws.

Habitat and locality. One holotype and one paratype female from grass and soil, Bathurst, January 1956. Collected by P.Graham.

SUPRFAMILY TROMBIDIOIDEA BANKS, 1904

These large mites are provided with a well developed palpal thumb-claw complex; the chelicerae are distinctive in that the movable chela is strong, short, hooklike and provided with distal teeth; the stigmata open at the base of the chelicerae and free peritremes are usually absent; the body is densely covered with short setae; the propodosoma is usually provided with a crista metopica or sclerotized sensory area and only a single pair of sensory setae; genital suckers are present; the tarsi are provided with claws and empodia may be either present or absent. The larvae are heteromorphic.

The following two families are included in this superfamily: Trombidiidae Leach, 1815 and Trombiculidae Ewing, 1944.

FAMILY TROMBIDIIDAE Leach, 1815

The trombidiids are extremely numerous in both numbers and different species and can be recognised by their velvety appearance resulting from their dense coat of setae. The body, which is divided into a more or less distinct gnathosoma, propodosoma and hysterosoma, is never 8-shaped. The chelicerae each consist of a basal muscular segment and a curved, blade-like distal portion, the latter being provided with saw-like teeth on its dorsal edge. Free peritremes are usually absent and the stigmata open near the medio-dorsal, proximal surface of the chelicerae. The five-segmented palpus is provided with a terminal tibial claw which is opposed by the palpal tarsus in a thumb-like manner. A dorsal scutum or crista metopica is situated on the median portion of the propodosoma. One (very seldom two) pairs of sensory setae are located on the lateral expansions of the scutum. Anteriorly the scutum.....

scutum.....

scutum ends in an expanded plate that may project over the gnathosoma as a tectum and bearing numerous setae. The plate may also be absent and the scutum rudimentary, consisting only of areas for the origin of the sensillae. The members of the Stygothrombiinae are extremely degenerate. They have long and worm-like bodies without numerous setae and typical mouth parts.

Thor & Willmann (1947) divided this family into fifteen subfamilies. One of these the Trombiculinae is now generally regarded as a separate family.

Key to the South African species and genera of the family Trombidiidae associated with plants

1. Larvae with two median dorsal plates, the anterior one with eight setae, posterior one with two (seldom four) setae; third pair of legs with one deformed claw.....  
.....Ettmülleria Oudemans

a. Postero-median plate more or less elliptical (65  $\mu$  long and 156  $\mu$  broad); posterior portion of body with thirteen pairs of setae; two pairs of which are borne on four rounded plates; the others set on tubercles; distal pair the longest (111  $\mu$ ); length of body (including gnathosoma) 394  $\mu$ ; breadth 200  $\mu$ .....E. pretoriae, n.sp.

--. Adults.....2

2. Peritreme associated with cheliceral stigmata; eyes on movable peduncles; tarsus with empodium between two claws..... Allothrombinae

Empodium consisting of two thin fringed structures; crista consisting of three parts, median part shield.....

shield.....

shield-like; two pairs of eyes on movable peduncles;  
dorsal body setae long and feathered.....

.....Allothrombium Berl.

a. Dorsal feathered setae measuring 45-75  $\mu$ ;  
sensory setae on crista 130  $\mu$ ; length of body  
excluding gnathosoma) 787  $\mu$ ; length (including  
gnathosoma) 1022  $\mu$ ; breadth 425  $\mu$ .....

.....A. lawrencei, n.sp.

--. Peritreme absent; double eye (very seldom without eyes) on  
either side of crista, not on movable peduncles.....

.....(Microtrombidiinae).....3

3. Dorsal setose setae even or of different lengths; the palpal  
tibia with or without an accessory claw and one or two  
external spines; legs I and IV shorter than the body.....

.....Microtrombidium Haller

a. Twelve spines arranged into two combs of five and  
seven respectively, situated posterior to the  
accessory claw on the inner side of the palp;  
tarsus I 213  $\mu$  long and 112  $\mu$  broad; length of  
body (excluding gnathosoma) 1325  $\mu$ ; length (including  
gnathosoma) 1620  $\mu$ ; breadth 940  $\mu$ .....M. grahami,  
n. sp.

--. Palpal tibia with less than twelve spines on inner  
side.....b

b. Dorso-medially, palpal tibia with five spines arrange  
into two groups of two and three respectively;  
dorsal setae measuring 26-38  $\mu$ ; tarsus I 147  $\mu$  long  
and.....

and.....

and 86  $\mu$  broad; length of body (excluding gnathosoma)  
1300  $\mu$ ; length (including gnathosoma) 1510  $\mu$ ;

breadth 710  $\mu$ .....M. potchefstroomense, n.sp.

--. Dorso-medially, palpal tibia with three spines;  
sensory setae on crista 101  $\mu$ ; dorsal body setae  
short (17  $\mu$ ); tarsus I 125  $\mu$  long and 44  $\mu$  broad;  
length of body (excluding gnathosoma) 777  $\mu$ ; length  
(including gnathosoma) 976  $\mu$ ; breadth 500  $\mu$ .....

.....M. spinosum, n.sp.

--. Usually with two or more different types of setae (pearshaped  
clubshaped etc.) which are feathered or covered with long  
barbules.....Enemothrombium Berl.

a. Dorsal body setae foliolated in dorsal view and  
provided with many small spines and six to eight  
strong barbules dorso-laterally; length of body  
(excluding gnathosoma) 602  $\mu$ ; length (including  
gnathosoma) 762  $\mu$ ; breadth 404  $\mu$ .....

.....E. curiosetosum, n.sp.

Genus ETTMULLERIA Oudemans, 1911

This difficult and perhaps even hypothetical genus was  
erected to accomodate a larval form described by Trägårdh as  
Trombidium sucidum. Some authors consider this genus as re-  
presenting a subgenus of Microtrombidium while others treat it  
as an independent genus. No definite proof exists as to which  
group of known adults these larval forms correspond.

Thor & Willmann (1947) defined this genus as follows:  
Larvae which are provided with two median dorsal plates, of  
which the anterior one bears eight setae (including the two  
sensory setae) and the posterior one two (seldom four) setae.

The....



The anterior edge of the antero-median plate is curved ventrad. Behind the dorsal plates a number of pappillary plates may be present, each bearing a single seta. One of the claws of leg III is deformed.

Ettmülleria pretoriae, n.sp.

(Figs. K 1-2)

This species can be separated from closely related forms on the basis of the shape of the postero-median plate, and the presence of thirteen pairs of setae on the posterior portion of the body.

Dimensions: Length of body (including gnathosoma) 394  $\mu$ ; breadth of body 200  $\mu$ . The body is oval-shaped.

Dorsum (fig. 1). The antero-median plate bears one pair of sensory setae and three pairs of ordinary setae; the anterior sublateral pair ~~are~~<sup>is</sup> relatively shorter and finer than the others. One pair of sublaterals ~~are~~<sup>is</sup> situated more or less in the middle of the plate and one pair at its posterior corners. Only one eye could be observed near the lateral margin of the antero-median plate. As in E. obscura Womersley the sides of the postero-median plate are pointed but the fact that the posterior edge of the plate is not deeply convex medially, differentiates these two species. The shape of this plate can be described as more or less elliptical and it is 65  $\mu$  long and 156  $\mu$  broad. As in E. obscura, E. australis Womersley and E. sucidum Trägårdh one pair of setae ~~are~~<sup>is</sup> situated behind the middle of the postero-median plate. Similar to the condition in E. sucidum but differing from E. australis and E. obscura, this species has four inconspicuous rounded plates, the two in the postero-median region being the biggest; each of these plates bears a seta and laterally to them three pairs of setae are borne on tubercles. The interscutal membrane is striated. Eight pairs of setae, seven.....

seven.....

seven pairs of which each measures  $41\mu$  and one posteriorly measuring  $111\mu$ , are set on tubercles on the posterior extremity of the body. All the dorsal setae are distinctly setose.

Venter. The ventral surface is similar to that of E. sucidum. Coxa I is provided with two setae, coxae II and III each with one seta. Two setae which are set on tubercles are situated immediately anterior to coxae III. On each side of the anus two setae arise from tubercles.

Gnathosoma. The penultimate segment of the three-segmented palpus is provided with one claw. The chelicerae are normal for the genus.

Legs. All the legs are shorter than the body. Tarsi I and II are each provided with two claws; tarsus III is shown in fig. 2.

Habitat and Locality. The holotype from an unidentified wild shrub, Pretoria, January 1956.

#### SUBFAMILY ALLOTHROMBIINAE THOR, 1935

The trombidiids belonging to this subfamily can be recognised by the following characteristics: The body is large and provided with feathered, seldom furcate setae. Each side of the propodosoma bears two eyes situated on a long peduncle. The crista is distinctly tripartite and has a large broad, cross or heart-shaped sensillary area which is provided with two pseudostigmal setae. The palpi are large and each is provided with a large apical claw but they are devoid of accessory claws or combs of spines. The legs are short or of moderate.....

moderate.....

moderate length; the tarsi are provided with characteristic pulvilli or as in the genus Coreothrombium, a brush-like bristle is present on the outer side of each claw.

Genus ALLOTHROMBIUM Berl., 1903

This genus constitutes a very homogeneous group and can be recognised by the following: The tarsus is provided with a pulvillus which consists of two thin fringed structures. According to André(1958) this pulvillus is not an empodium but only took over its functions; it consists of modified setae. The crista is divided into three parts; the median part is shield-like and provided with two long pseudostigmatic setae. The two pairs of eyes are carried on movable peduncles. The body setae are long and feathered.

Allothrombium lawrencei, n.sp.

(Figs. K 3-8)

This species resembles A. fuliginosum (Herm.) in the shape of the crista but differs from it by its size and by the relative length of the dorsal setae and the sensory setae on the crista.

Female (fig. 3)

Dimensions: Length of body (excluding gnathosoma) 787  $\mu$ ; length (including gnathosoma) 1022  $\mu$ ; breadth of body 425  $\mu$ ; length of leg I 626  $\mu$ , leg II 437  $\mu$ , leg III 334  $\mu$ , leg IV 500  $\mu$ . The body is egg-shaped and the colour probably red.

Dorsum. The entire dorsum is thickly covered with feathered setae (fig. 4) which measure 45-95  $\mu$ . In this respect it differs from A. fuliginosum in which the dorsal setae are much longer

(150-190  $\mu$ ).....

(150-190  $\mu$ ).....

(150-190  $\mu$ ). The triangular median portion of the crista (fig. 5) bears two sensory setae which are much longer than those of A.fuliginosum; they measure 130  $\mu$ . The eyes on both sides of the body are situated on peduncles.

Venter. Two pairs of genital suckers (fig. 6) are present.

Gnathosoma. All the segments of the palpi (fig. 7) are covered with setose setae. The palpal tarsus is longer than the claw. The chelicerae are typical for the family.

Legs. All the legs are shorter than the body. Tarsus I is longer than tibia I and is 136  $\mu$  long and 61  $\mu$  broad. Each tarsus is provided with two claws and a hairy pulvillus (fig. 8). The legs are thickly covered with setose setae.

Habitat and locality. One holotype female from grass and soil, Bathurst, January 1956. Collected by P. Graham.

#### SUBFAMILY MICROTROMBIDIINAE THOR, 1935

The distinctive characters of the subfamily are the following; The cordate body is small or of moderate size. The propodosoma is usually triangular and its base is slightly narrower than the hysterosoma; the latter slightly tapers and is rounded posteriorly. A distinct suture separates the propodosoma from the hysterosoma. The crista is linear and usually devoid of any enlarged triangular or subtriangular anterior area or nasus but is provided with a rounded subposterior areola-like sensillary area which is furnished with a pair of long sensory setae. Two eyes are usually present. The palpi are generally stout and are provided with a stout apical claw, a smaller accessory claw, one or two dorso-medial combs and one or more strong spines laterally.....

laterally....

laterally. The dorsal setae are variable in form, and may be simple, spinelike, setose or have other curious forms. One species is often provided with setae of distinct sizes or shapes.

Genus MICROTROMBIDIUM Haller, 1882

The members of this genus can be recognised by the dorsal setose setae which may be of equal or variable lengths. The palpal tibia may or may not be provided with an accessory claw and one or two lateral spines. The legs are shorter or slightly longer than the body. The tarsi of the first pair of legs are thickened.

Womersley (1945) in his revision of this genus used the dimensions of the front tarsi and metatarsi and the lengths and structure of the dorsal setae as characters for species distinction.

Microtrombidium grahami, n. sp.

(Figs. K 9-12)

The dorsal chaetotaxy, the first pair of legs and certain aspects of the palp resemble the condition obtaining in M. tarsale André. However, the stronger palp which has two combs, consisting of five and seven spines respectively, on the penultimate segment distinguished M. grahami from M. tarsale and other closely related species of the genus Microtrombidium.

Female (fig. 9)

Dimensions: Length of body (excluding gnathosoma) 1325  $\mu$ ; length (including gnathosoma) 1620  $\mu$ ; breadth of body 940  $\mu$ . The body is oval-shaped.

Dorsum. The middle part of the anterior margin of the propodosoma is fringed with eight long forwardly directed setose setae. The crista metopica (fig. 10) is situated on the median portion of the propodosoma. The crista is provided with two sensory setae each having a length of 85  $\mu$ . The entire dorsum is densely covered with setae (fig. 11) which are setose as in M. tarsale. The lengths of the dorsal setae are 22-31  $\mu$  which are longer than those of M. tarsale. One pair of eyes ~~are~~<sup>is</sup> situated on each side of the body.

Venter. Three pairs of suckers are associated with the genital opening.

Gnathosoma. The palpi (fig. 12) are stronger than those of M. tarsale. The terminal claw on the penultimate segment is well developed and is accompanied by a shorter but fairly strong accessory claw. Two inner combs, an anterior one consisting of five spines and a posterior one of seven, are present on the penultimate segment. The proximal part of this segment bears five spine-like setae. In addition to the inner structures the tarsus is also provided with one spine on its outer side. The palpal tarsus is clothed with setose setae.

Legs. All the legs are much shorter than the body and densely covered with setose setae. The tarsus of the first pair of legs resembles that of M. tarsale in shape and is 213  $\mu$  long and 112  $\mu$  broad. Two claws are present on each tarsus.

Habitat and locality. The holotype and four paratypes from grass and soil, Bathurst, January 1956. Collected by P. Graham.

Microtrombidium potchefstroomense, n.sp.

(Figs. K 13-16)

The structure of the dorsal setae, the first pair of legs and the palp are characters that bear a resemblance to those of M. vilhenaorum André and M. robustum André. M. potchefstroomense may, however, be distinguished from these related forms in the number of the spines on the penultimate segment of the palp. In this respect it also differs from other species of Microtrombidium.

Female (fig. 13)

Dimensions: Length of body (excluding gnathosoma) 1300  $\mu$ ; length (including gnathosoma) 1510  $\mu$ ; breadth of body 710  $\mu$ . The body is egg-shaped and about twice as long as broad.

Dorsum. The front margin of the propodosoma is provided with a fringe of long, slender setose setae. The crista (fig. 14) is provided with two long sensory setae. Two pairs of eyes are present on the propodosoma. The dorsum is densely clothed with setose setae (fig. 15) which measure 26-38  $\mu$ . These setae are shorter than those of M. vilhenaorum and longer than those of M. robustum.

Venter. The genital opening is flanked by three pairs of genital suckers.

Gnathosoma. The palpi (fig. 16) are covered with setose setae. The terminal claw is well developed and the accessory claw is much shorter but still fairly strong. Dorso-medially the penultimate segment bears five spines in comparison with the six of M. vilhenaorum and M. robustum. As in M. robustum these spines are arranged.....

arranged.....

arranged into two groups, the anterior group consisting of two spines and the posterior one of three. In this respect it also differs from M. vilhenaorum. As in M. robustum this segment is also provided with two medially situated spine-like setae. The palpal tarsus is somewhat shorter than the claw and bears distally a rather long and a relatively short seta; the rest of the tarsus is covered with setose setae.

Legs. All the legs are much shorter than the body and are densely covered with setose setae. The tarsus of leg I resembles that of M. vilhenaorum in shape but is 147  $\mu$  long and 86  $\mu$  broad. Each tarsus is provided with two claws.

Habitat and locality. The holotype and one paratype from grass and dead organic material collected under a thorn-tree, Potchefstroom, December 1953.

Microtrombidium spinosum, n.sp.

(Figs. K 17-20 )

Although this species resembles M. jabanicum Berl. as regards the presence of three spines posterior to the accessory claw on the inner side of the palp and a short stout lateral spine, its significantly longer tarsus I readily distinguishes these two species.

Female (fig. 17)

Dimensions: Length of body (excluding gnathosoma) 777  $\mu$ ;  
length (including gnathosoma) 976  $\mu$ ; breadth of body 500  $\mu$ .  
This red mite is more or less cordate.



Dorsum. The distribution of the dorsal setose setae (fig. 18) is moderately dense. These setae are provided with fairly long setules and each has a length of  $17\ \mu$ . The linear crista (fig. 19) is provided with a subposterior sensillary area on its posterior quarter, the two sensory setae each measuring  $101\ \mu$ ; the anterior edge is provided with relatively long setose setae. Two eyes are present on each side, well in front of the sensillary area.

Venter. The genital region is provided with two pairs of suckers.

Gnathosoma. The palpi (fig. 20) are fairly stout; the tibia bears an apical claw and a smaller accessory claw; posteromedially to the latter it is provided with three spines. On its outer side it bears a stout spine. All the segments of the palpus are covered with setose setae.

Legs. The first pair of legs are more or less three quarters as long as the body. The second and third pair are the shortest. All the legs are thickly covered with setose setae. Tarsus I is  $125\ \mu$  long and  $44\ \mu$  broad. The tarsi are each provided with two claws.

Habitat and locality. One holotype female from grass, Potchefstroom, May 1958.

Genus ENEMOTHROMBIUM Berl., 1910

This genus constituted a reunion of species not presenting any homogeneity. Since 1910 a number of authors tried to group these species in a more natural order and created a number of new genera. André (1958), however, still suggests a further revision of this genus.

Thor & Willmann (1947) defined this genus as follows:

The....

The....

The dorsal body setae are of different types e.g. pearshaped, club-shaped etc. These setae are feathered or covered with long barbules. Each individual is usually provided with two to three different kinds of setae. Several kinds of setae or spines also occur on the fourth palpal segment, frequently arranged into one or two combs.

Enemothrombium curiosetosum, n.sp.

(Figs. K 21-25)

On account of the form of the dorsal setae this species can be separated from all the other species of the genus Enemothrombium.

Dimensions: Length of body (excluding gnathosoma) 602  $\mu$ ; length (including gnathosoma) 762  $\mu$ ; breadth of body 404  $\mu$ ; length of leg I 542  $\mu$ , leg II 280  $\mu$ , leg III 269  $\mu$ ; leg IV 460  $\mu$ .

Dorsum (fig. 21). The dorsum is densely covered with setae (fig. 22 & 23) which appears foliolated in dorsal view; each seta is provided with six to eight strong spines dorso-laterally, as well as with many small spines. The triangular propodosoma bears feathered setae both laterally and posteriorly. The crista (fig. 24) which is situated medially on the propodosoma, is provided with two fine sensory setae. No eyes could be observed.

Gnathosoma. The palpal tibia is provided with a strong claw and four spines on its outer side as well as with a number of setose setae. The remaining segments, as shown in fig. 25, are covered with flattened setose setae. The movable chela is blade-like and finely toothed; the portion of the chelicera projecting below the movable chela consists of a fine transparent membrane.

Legs. The legs are all shorter than the body and thickly covered with setose setae. Tarsus I is more or less twice as long as broad. Each of the tarsi is provided with two claws.

Habitat and locality. One holotype specimen from grass and soil, Bathurst, January 1956 . Collected by P. Graham.

IV. REFERENCES

- ANDRÉ, M. 1958. Acariens Thrombidions (adultes) de l' Angola. Cia diamant. Angola, Publ. cult. 35. 124 p., 259 figs.
- BAKER, E.W. 1946. Some Tydeidae (Acarina) from the fig tree (Ficus carica L.). An. Esc. nac. Cienc. biol., Mex. 4 (2-3): p. 255-261, 16 figs.
- 1949. A review of the mites of the family Cheyletidae in the United States National Museum. U.S. nat. Mus., Proc. 99 (3238): p. 267-320, pls. 6-17.
- & ANITA HOFFMAN. 1948. Acaros de la familia Cunaxidae. An. Esc. nac. Cienc. biol., Mex. 5 (3-4): p. 229-273, 10 pls.
- & A.E. PRITCHARD. 1953a. A review of the false spider mite genus Tenuipalpus Donnadieu (Acarina: Phytoptipalpidae) Ent. Soc. Amer., Ann. 46 (3): p. 317-336, 7 pls.
- & A.E. PRITCHARD. 1953b. The family categories of Tetranychoid mites, with a review of the new families Linotetranychidae and Tuckerellidae. Ent. Soc. Amer., Ann. 46: p. 243-258, 9 figs.
- & A.E. PRITCHARD. 1956. False spider mites of the genus Dolichotetranychus (Acarina: Tenuipalpidae) Hilgardia 24 (13): p. 357-381, 13 figs.
- & G.W. WHARTON. 1952. An introduction to acarology. Macmillan co., New York. xiii, 465 p., 1 col. pl., 377 figs.
- BANKS, N. 1915. The Acarina or mites. U.S. Dept. Agric., Rep. 108. 153 p., 294 figs.
- BERLESE, A. 1882-1903. Acari, Myriapoda et Scorpiones hucusque in Italia reperta. fasc. 1-101. Padua. Figs.
- 1910. Acari nuovi. Manipulus 5. Redia 6 (2): p. 199-214.

-- 1916. Centuria seconda di Acari nuovi. Redia 12: p. 125-177.

CANESTRINI, G. 1890. Prospetto dell'acarofauna Italiana.

Famiglie: Tetranychini, Ixodini, Argasini. 4. Padova;  
p. 427-540, figs.

CUNLIFFE, F. 1955. A proposed classification of the Trombidiforme  
mites (Acarina) . Ent. Soc. Wash., Proc. 57 (5): p. 209-218.

EHARA, S. 1956. Tetranychoid mites of Mulberry in Japan.

Hokkaido Univ. Fac. Sci., J. Ser. 6. Zool. 12 (4):  
p. 499-510, 32 figs.

EVANS, G.O. 1957. An introduction to the British Mesostigmata  
(Acarina) with keys to families and genera. Lim. Soc., J.  
(Zool.) 43 (291): p. 203-259, 92 figs.

EWING, H.E. 1913. The taxonomic value of the character of the  
male genital armature in the genus Tetranychus Dufour.  
Ent. Soc. Amer., Ann. 6: p. 453-460, 1 fig.

GARMAN, P. 1948. Mite species from apple trees in Connecticut.  
Conn. agric. Exp. Sta., Bull. 520. 27 p., 22 figs.

GEIJSKES, D.C. 1939. Beiträge zur Kenntnis der europäischen  
Spinnmilben (Acari, Tetranychidae) mit besonderer Berücksichtigung  
der niederländischen Arten. Wageningen Landb.  
Hooges., Meded. 42 (4). 68 p., 44 figs.

GRANDJEAN, F. 1938. Observations sur les Bdelles (Acariens) Soc.  
Ent. Fr., Ann. 107. 24 p., 4 figs.

-- 1942. Observations sur les Labidostommidae. Paris. Mus. Hist.  
nat., Bull. ser. 2, 14 (2): p. 118-125, 2 figs.; (3): p.  
185-192, 3 figs.; (5): p. 319-326, 2 figs.; (6): p. 414-418,  
1 fig.

- 1944. Observations sur les acariens de la famille des Stigmaeidae. Arch. Sci. Phys. nat. 26 (5): p. 103-131, 5 figs.
- GREENBERG, B. 1952. New Labidostommidae with keys to the New World species (Acarina). N. Y. ent. Soc., J. 60: p. 195-209, pls. 19-21.
- JACK, R.W. 1908. The earth flea. C.G.H. Agric. J. 3.
- JACOT, A.P. 1939. New mites from the White Mountain. Boston Soc.nat. Hist., Occ. Pap. 8: p. 321-332, 21 figs.
- ← LAWRENCE, R.F. 1940. Three new parasitic mites (Acarina) from South Africa. Ent. Soc. S. Afr., J. 3: p. 109-119, 7 figs.
- 1943. New South African mites of the genus Tenuipalpus Donnadieu (Tetranychidae). Roy. Soc. S. Afr., Trans. 30 (1): p. 35-48, 6 figs.
- 1954. The known African species of Cheyletidae and Pseudocheylidae (Acarina, Prostigmata). Natal Mus., Ann. 13 (1): p. 65-77, 6 figs.
- MCGREGOR, E.A. 1950a. Mites of the genus Neophyllobius. S. Calif. Acad. Sci., Bull. 49 (2): p. 55-70, figs. 15-25.
- 1950b. Mites of the family Tetranychidae. Amer. Midl. Nat. 44 (2): p. 257-420, 45 pls., 22 figs.
- MELTZER, J. 1955. Morphological notes on Brybia forms of fruit trees and ivy. Ent. Ber., Amst. 15: p. 337-339, 2 figs.
- MULLER, O.F. 1776. Zoologiae Danicae Prodrromus. Copenhagen. 282 p.
- OUDEMANS, A.C. 1903. Acarologische aantekeningen, 8. Ent. Ber., Amst. 14: p. 96-111.

- 1915. Notizen über Acari. Arch. Naturgesch. 81 (A, 5). 78 p.
- 1926-1937. Kritisch historisch overzicht der acarologie  
(Vol. 1 and 2 suppl. to vol. 69 and 72 of Tijdschr. Ent.  
Leiden. Vol. 3 published in six parts independently).  
1926. 850 V.C.-1758. vol. 1. vii, 500 p., figs.  
1929. 1759-1804. vol. 2. xvi, 1097 p., figs.  
1936-1937. 1805-1850. vol. 3. ci, 3379 p., figs.
- 1931. Acarologische aantekeningen, 108. Ent. Ber., Amst.  
8 (179): p. 251-263, 8 figs.
- 1936. Neues über Anystidae (Acari). Arch. Naturgesch. N.F.  
5: p. 364-446, 28 figs.
- PARENT, B. & E.J. LEROUX. 1956. Note on Mediolata mali (Ewing)  
(Acarina = Raphignathidae) as a predator of the European  
red mite. Canad. Ent. 88: p. 487.
- PRITCHARD, A.E. & E.W. BAKER. 1955. A revision of the spider mite  
family Tetranychidae. Pacif. Coast ent. Soc., Mem. 2,  
472 p., col. pl., 391 figs.
- RYKE, P.A.J. & MAGDALENA K.P. MEYER. 1958. Spider mites and  
false spider mites with notes on South African species  
and the basic concepts regarding their biological  
control. S. Afr. J. Agric. Sci. 1, 4 (in press)
- SAYED, M.T. 1942. Contribution to the knowledge of the Acarina  
of Egypt. 2. The genus Tenuipalpus Donnadieu. Soc. ent.  
Egypte, Bull. 26: p. 81-91, 3 pls.
- 1946. The genus Anychus McGregor in Egypt and the Sudan  
(Acarina: Tetranychidae). Soc. Fouad Ent., Bull. 30:  
p. 143-148, 17 figs.

- SOUTHCOTT, R.V. 1946. On the family Smarididae (Acarina). Linn. Soc. N.S.W., Proc 70 (3-4): p. 173-178, 4 figs.
- SUMMERS, F.M. & E.I. SCHLINGER. 1955. Mites of the family Caligonellidae (Acarina). Hilgardia 23 (12): p. 539-552, 9 pls.
- THOR, S. 1913. Biscirus genus novum; eine neue Bdelliden-Gattung und zwei neue Untergattungen. Zool. Anz. Leipzig 42: p. 28-30.
- 1930. Beiträge zur Kenntnis der Invertebratenfauna von Svalbard. Svalb. og Ishavet, Skr. 27. 156 p., 26 pls., 5 figs.
- 1931a. Nordafrikanische Bdellidae und Cunaxidae von Dr. F. Grandjean (Paris) 1931 gesammelt. Zool. Anz. Leipzig 97 (3-4): p. 62-79, 11 figs.
- 1931b. Acarina. Bdellidae, Nicoletiellidae, Cryptognathidae. Das Tierreich, Leipzig (W. de Gruyter & co.) 56. xiii, 87p., 93 figs.
- 1931c. Eine neue Labidostomma- Art aus Moos von Südafrika. Zool. Anz. Leipzig 93 (1-2): p. 57-58, 2 figs.
- 1932. Norwegische Tydeidae viii-xv, mit Bemerkungen über die Gattung Tydeus and über Augen, Tracheen usw. Zool. Anz. Leipzig 98 (3-4): p. 69-91, 17 figs.
- 1933. Acarina. Tydeidae, Ereyneidae. Das Tierreich, Leipzig (W. de Gruyter & co.) 60. xi, 84 p., 102 figs.
- 1934. Eine neue Eupodes- Art von Südafrika und eine neue Cocceupodes- Art von Norwegen. Zool. Anz. 108 (7/8): p. 178-179.
- & C. WILLMANN. 1941. Acarina. 71 a. Eupodidae, Penthaleidae, Penthaleidae, Rhagidiidae, Pachygnathidae, Cunaxidae. Das Tierreich, Berlin 71. 186 p., 252 figs.



- & C.WILLMANN. 1947. Acarina. 71b. Trombidiidae. Das Tierreich, Berlin 71: p. 187-541, figs. 253-599.
- TRÄGÅRDH, I. 1906. Neue Acariden aus Natal und Zululand. Zool. Anz. 30: p. 870-877.
- TUCKER, R.W.E. 1925. The black sand mite: Penthaleus destructor n. sp. Union S. Afr. Dept. Agric. Div. Ent., Mem. 3: p. 23-33, 3 pls.
- 1926. Some South African mites, mainly Tetranychidae and Eriophyidae. Union S. Afr. Dept. Agric. Div. Ent., Mem. 5. 15 p., 5 pls.
- TURK, F.A. & S.M. TURK. 1952. Studies on Acari--- 7th series. Records and descriptions of mites new to the British fauna together with short notes on the biology of sundry species. Ann. Mag. nat. Hist. (12) 5: p. 475-506, 34 figs.
- VITZTHUM, H.G. 1929. Ordnung: Milben, Acari. Tierwelt Mitteleur. 3 (7). 112 p., 12 pls., 138 figs.
- 1931. Acari In Kükenthal u. Krumbach. Handb. Zool. Berl. 8 vols. Bd. 3 Hälfte 2. 160 p., 161 figs.
- 1940-43. Acarina In Bronns Klassen Abt. 4 Buch 5 Lief. 1-7. 1011 p., 522 figs.
- WOMERSLEY, H. 1933. On some Acarina from Australia and South Africa. Roy. Soc. S. Aust., Trans. 57: p. 108-112, 22 figs.
- 1940. Studies in Australian Acarina, Tetranychidae and Trichadenidae. Roy. Soc. S. Aust., Trans. 64 (2): p. 233-265, 16 figs.
- 1945. A revision of the Microtrombidiinae (Acarina, Trombidiinae) of Australia and New Guinea. S. Aust. Mus., Rec. Adelaide 8 (2): p. 293-355, 38 figs.