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STUDIES OF QUEENSLAND TETRANYCHIDAE. 3. RECORDS OF THE GENUS TETRANYCHUS

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SUMMARY

Nine species of the genus *Tetranychus* are here recorded from Queensland, but the occurrence of one, *T. desertorum* Banks (*T. opuntiae* Banks), has not been confirmed by the present study. The other eight species are *T. dianellae* Davis, *T. hydrangeae* Pritchard and Baker, *T. lambi* Pritchard and Baker, *T. ludeni* Zacher, *T. marianae* McGregor, *T. neocaledonicus* André, *T. telarius* (L.) and *T. urticae* Koch. Records of collections of these species in Queensland are listed, showing their known distribution, host plants, and economic importance.

INTRODUCTION

There has been no systematic account published of the genus *Tetranychus* in Queensland. Womersley (1940) in a taxonomic paper recorded *T. urticae* from Brisbane and Nambour on dahlia, cornflower, *Cupressus* sp. and strawberry. Pritchard and Baker (1955) reported *T. ludeni* from Taringo (probably Taringa, a Brisbane suburb) on *Convolvulus* sp.

In the economic literature, an early reference to the damage caused to fruit trees in this State by *Tetranychus* sp. was made by Tryon (1889). Later references recorded *T. telarius, T. lambi, T. ludeni* and *T. urticae* as pest species (e.g. Davis and Heather 1962; Brimblecombe 1953). These and other records of *T. telarius* probably concern the species stated in the present paper to be *T. urticae* Koch.

Full synonymies of species are not listed here as they are given by Pritchard and Baker (1955), and, more recently, for species in the Telarius species complex by Boudreaux and Dosse (1963*a*).

Genus **Tetranychus** Dufour

1832 *Tetranychus* Dufour: Ann. Sci. Nat. Paris, 25:276.

(1) **Tetranychus desertorum** Banks

1900 *Tetranychus desertorum* Banks: Tech. Bull. U.S. Dept. Agr. Div. Ent., 8:76.

1908 *Tetranychus opuntiae* Banks. Proc. Ent. Soc. Wash., 10:36.

Tetranychus opuntiae, regarded by Pritchard and Baker (1955) as synonymous with *T. desertorum,* is listed by Wilson (1960) as having been accidentally introduced into Queensland in 1922 or 1923, and found mostly on *Opuntia inermis* (DC.)DC. Haseler (1966) stated that *T. opuntiae* was last recorded from North Rockhampton in 1948, and assumed that it has since died out. The present author has not found any spider mites on *Opuntia* species, and no specimens are available from earlier collections. It has not been possible therefore to comment on the identity of the mite, or to determine whether the species is still present in Queensland.

(2) **Tetranychus dianellae** Davis

1966 *Tetranychus dianellae* Davis: Qd J. Agric. Anim. Sci., 24: 201. The aedeagus is illustrated in Fig. 1A.

Host Plant and Locality—QUEENSLAND: *Dianella caerulea* Sims, a blueberry lily, Perwillowen, near Nambour, June 1966, D.A.I.

T. dianellae is of no known economic importance.

(3) **Tetranychus hydrangeae** Pritchard and Baker

1955 *Tetranychus hydrangeae* Pritchard and Baker: Mem. Pacif. Cst Ent. Soc. 2:425.

Specimens from Queensland have dorsal integumentary lobes narrow, triangular, slightly separated at the base and with dense tips. Ventral striae have broadly triangular rounded lobes between the first and second pairs of hysterosomal setae, extending back to just posterior of the second pair of hysterosomal setae, but the propodosoma and the posterior region of the hysterosoma are without ventral integumentary lobes. The aedeagus is illustrated in Figure 1B. Adult females are carmine.

Host plants and localities—QUEENSLAND: *Hydrangea macrophylla* (Thunb.) Ser., hydrangea, Town Mt. (Nambour) 11.xi.1964, D.A.I.; Nambour 7.iv.1965 J.J.D. Although *T. hydrangeae* is recorded only from the Nambour district, its host is a popular introduced garden plant which has been widely distributed as cuttings or established plants, so that this mite is now probably widespread.

(4) **Tetranychus lambi** Pritchard and Baker

1955 *Tetranychus lambi* Pritchard and Baker: Mem. Pacif. Cst Ent. Soc. 2:399.

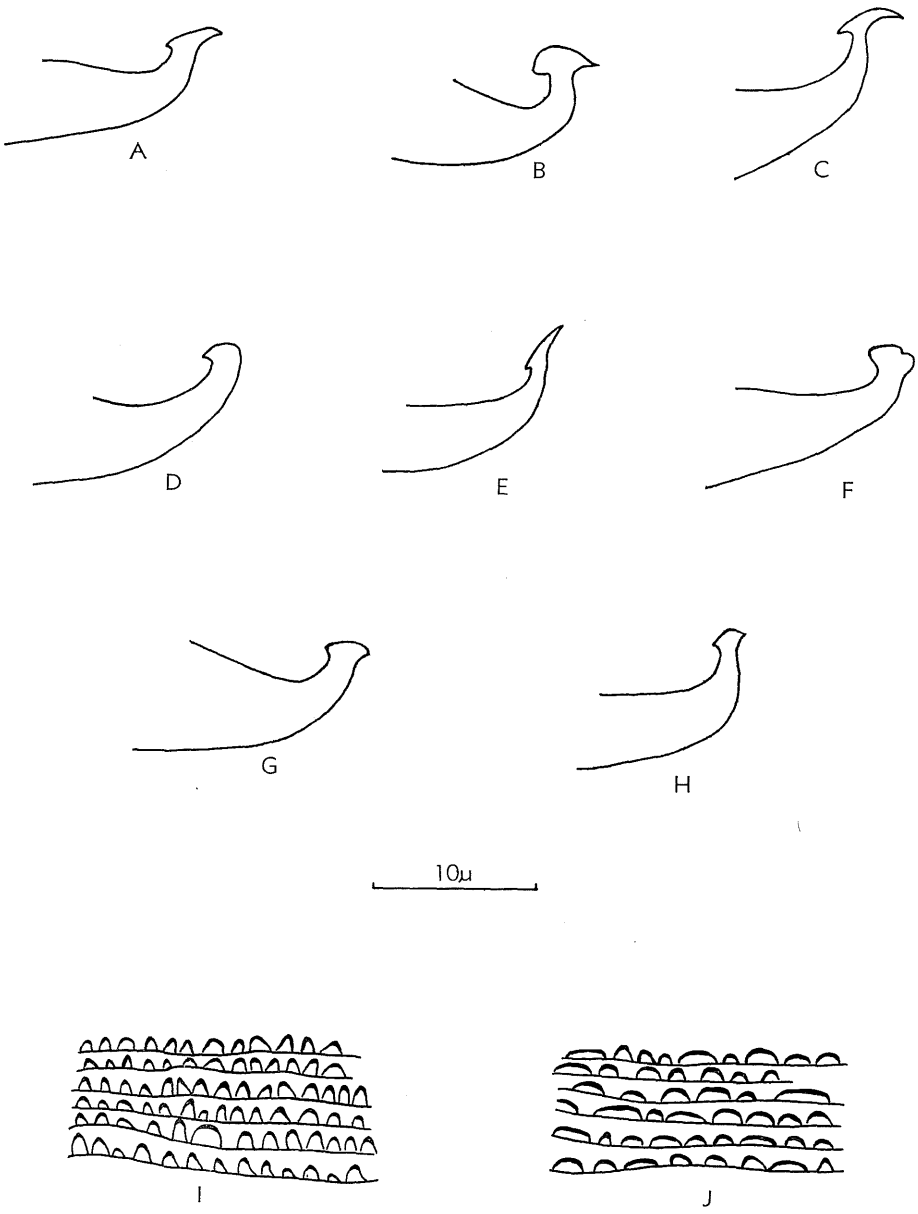

Fig. 1.—A. *T. dianellae* (from *Dianella caerulea*, Perwillowen), aedeagus. B. *T hydrangeae* (from hydrangea, Nambour), aedeagus. C. *T. lambi* (from Rhodes grass, Mundubbera), aedeagus. D. *T. ludeni* (from Gambia pea, Nambour), aedeagus. E. *T. marianae* (from cotton, Walkamin), aedeagus. F. *T. neocaledonicus* (from acalypha, Redcliffe), aedeagus. G. *T. telarius* (from violet, Nambour), aedeagus. H. *T. urticae* (from papaw, Brisbane), aedeagus. I. *T. telarius* (from violet, Nambour), dorsal integumentary lobes of female. J. *T. urticae* (from papaw, Nambour), dorsal integumentary lobes of female.

Queensland specimens have dorsal integumentary lobes semi-circular, each with a dense basal spot and with similar lobes ventrally from the genital flap as far forward as the first pair of ventral hysterosomal setae. An obvious change occurs forward from this region, while the strial ridges are still distinctly and quite regularly incised, the lobes so formed are not so well defined as on the ventral hysterosoma and lack an obvious basal spot. Lobes of this less well defined kind are found about as far forward as the ventral propodosomal setae, but not on the hypostome. The aedeagus is illustrated in Figure 1C. Adult females are yellowish with several dark spots along each side.

Host plants and localities—QUEENSLAND: *Arachis hypogaea* L., peanut, Dalbeg, 2.x.1959, J.J.D. *Carica papaya* L., papaw, Sunnybank, 7.ix.1953, A.R.B.; Nambour, 6.ii.1964, D.A.I. *Centrosema plumieri* Benth., Kairi, 4.viii.1966, R. J. Elder. *Chloris gayana* Kunth, Rhodes grass, Mundubbera, 4.xi.1965, J.J.D. *Ctenanthe* sp., Atherton, 4.vii.1966, R. J. Elder. *Desmodium intortum* (Mill.) Urb., Atherton, 16.viii.1966, R. J. Elder. *Desmodium uncinatum* (Jacq.)DC., a tick-trefoil, Gympie, 13.iii.1963, K. G. Pegg; Nambour, 12.vii.1966, D.A.I. *Fragaria x ananassa* Duchesne, strawberry, Richlands, 23.vi.1957, J.J.D.; Ormiston, August 1957, J.J.D.; Victoria Pt., 13.xi.1957, J.J.D.; Nambour, Sept. 1958, W. A. Smith; Sunnybank, 20.vii.1964, L. W. Rigby. *Galactia tenuiflora* Willd., Boompa, 19.iv.1966, J.J.D. *Glycine tomentosa* Benth., woolly glycine, Kingscliff (northern N.S.W.), 13.xi.1965, K. G. Pegg. *Glycine javanica* L., glycine, Minbun, 16.viii.1966, R. J. Elder. *Homalocladium platycladum* (F. Muell.) L. H. Bail., ribbon bush, Nambour, 30.vi.1961, W. A. Smith. *Malus sylvestris* Mill., apple, Applethorpe, March, 1955, M. Bengston. *Morus alba* L., mulberry, Bollon, 12.xii.1957, J.J.D. *Musa* spp., banana varieties (cultivars), Gympie, 1947, A.R.B.; Nambour, 6.ii.1964, D.A.I.; Tanawah, 12.vi.1964, J.J.D. Mission Beach-Cardwell, 23.ii.1965, R. J. Elder; Eumundi, 4.vi.1965, K. G. Pegg. *Nicotiana tabacum* L., tobacco, Brisbane, 27.xi.1957, J.J.D.; Clare, 8.x.1958, J.J.D. *Oxalis* sp., Brisbane, 6.ix.1966, J.J.D.. *Panicum maximum* Jacq. var. *trichoglume* (K. Schum.) Eyles, green panic, Atherton, 28.viii.1966, R. J. Elder. *Phaseolus atropurpureus* DC., siratro, Nambour, 16.viii.1966, D.A.I. *Phaseolus caracalla* L., Kairi, 4.viii.1966, R. J. Elder. *Phaseolus vulgaris* L., French bean, Brisbane, October 1957, A.R.B. *Poncirus trifoliata* (L.) Raf., trifoliate orange, Ayr, 8.iii.1961, J.J.D. *Prunus persica* (L.) Batsch., peach, Ormiston, 30.xi.1958, A.R.B. *Rubus rosaefolius* Sm., native raspberry, Mapleton, 12.x.1964, J.J.D. *Sida rhombifolia* L., sida-retusa, Palmwoods, 22.v.1964, J.J.D. *Stephania japonica* (Thunb.) Miers var. *discolor* (Miq.) Forman, tape-vine, Gayndah, 2.ii.1965, J.J.D. *Stylosanthes gracilis* H.B.K., stylo, Nambour, 19.viii.1964, D.A.I. *Teramanus uncinatus* (L.) Sw., Kairi, 4.viii.1966, R. J. Elder. *Teramnus volubilis* Swartz, Kairi, 4.viii.1966, R. J. Elder. *Trifolium repens* L., white clover, Gayndah, 29.ix.1965, J.J.D.

Collections from northern, as well as southern, Queensland indicate that *T. lambi* is distributed throughout the coastal areas of the State. Favoured hosts

of economic importance are banana, strawberry and some legumes such as stylo. Although recorded from apple, *T. lambi* is not a pest of deciduous fruits in Queensland (Bengston 1963).

(5) **Tetranychus ludeni** Zacher

1913. *Tetranychus ludeni* Zacher: Mitt. Kais. Biol. Anst. Land-Forstw., 14:40.

Queensland specimens have dorsal intergumentary lobes narrow, separated at the base, triangular and pointed with dense tips. Ventral lobes are lower and more rounded than the dorsal lobes, many almost semi-circular and still with dense tips. Lobes of this kind extend from the genital flap as far forward as the first pair of ventral hysterosomal setae, then become more irregular, lower and broader, as far forward as the propodosomal setae. The striae on the hypostome are not lobed. The aedeagus is illustrated in Figure 1D. Adult females are bright carmine.

Host plants and localities.—QUEENSLAND: *Ageratum houstonianum* Mill., blue billygoat-weed, Bli Bli, 14.viii.1964, J.J.D.; Nambour 21.viii.1964, D.A.I. *Antirrhinum majus* L., snapdragon, Brisbane, Sept. 1957, R. P. Kleinschmidt. *Centrosema plumieri* Benth., Kairi, 4.viii.1966, R. J. Elder. *Citrullus vulgaris* Schrad., watermelon, Redcliffe, 30.x.1957, J.J.D., Maroochydore, 1.xii.1965, D.A.I. *Citrus reticulata* Blanco, mandarin, Bli Bli, 8.ix.1964, K. G. Pegg. *Crassocephalum crepidioides* (Benth.) S. Moore, thickhead, Nambour, 21.viii.1964, D.A.I. *Crotalaria goreensis* Guill & Perr., Gambia pea, Nambour, 23.viii.1965, K. G. Pegg; Town Mt., Nambour, 10.v.1966, D.A.I. *Dahlia* sp. dahlia, Rockhampton, 17.ii.1959, T. Passlow; Brisbane, 14.iv.1966, W. Yarrow; Nambour, 5.v.1966, D.A.I. *Dolichos lablab* L., Tonga bean, Nambour, 30.vi.1966, D.A.I. *Erigeron* sp. fleabane, Elimbah, 22.ii.1966, J. H. Barrett. *Fragaria x ananassa* Duchesne, strawberry, Ormiston, July 1957, J.J.D.; Nambour, Sept. 1958, W. A. Smith; Tanawha, 13.viii.1963, D.A.I.; Brisbane, 10.viii.1964, A.R.B.; Palmwoods, 3.ix.1964, D.A.I. *Galinsoga parviflora* Cav., potato weed, Belmont 10.xi.1965, J. H. Barrett. *Gerbera jamesonii* Bolus, gerbera, Ayr, 25.x.1958, J.J.D. *Glycine max* (L.) Merr., soybean, Hermitage, 16.iv.1963, T. Passlow; Walkamin, 3.ix.1965, G. W. Saunders. *Gossypium barbadense* L., cotton, Alton Downs, 26.iii.1957, T. Passlow; Ormiston, March 1958, J.J.D.; Ayr, 26.viii.1958, J.J.D.; Biloela, 2.iii.1961, T. Passlow; Bundaberg, 16.v.1961, T. Passlow; Hermitage, 16.iv.1963, T. Passlow, Atherton, 19.xi.1964, G. W. Saunders; Walkamin, 25.vi.1965, G. W. Saunders. *Helianthus annuus* L., common sunflower, Nambour, 16.iii.1965, J.J.D. *Hibiscus syriacus* L., rose-of-Sharon, Nambour, 5.v.1966, D.A.I.; Bundaberg, 13.vi.1966, D.A.I. *Holmskioldia sanguinea* Retz., Chinese-hat plant, Buderim, 24.viii.1966, D.A.I. *Ipomoea purpurea* (L.) Roth, common morning glory, Buderim, 22.iii.1966, J.J.D. *Ipomoea batatas* (L.) Lamk., sweet potato, Montville, 30.x.1963, J.J.D. *Lathyrus odoratus* L., sweet pea, Nambour, 19.viii.1964, D.A.I. *Oxalis martiana* Zucc. = *corymbosa* DC., large-leaf wood sorrel, Nambour, 24.vi.1965, J.J.D. *Phaseolus vulgaris,* L., French bean, Brisbane, August 1957, A.R.B.; Ormiston,

June, 1957, J.J.D.; Cleveland, 19.xi.1957, J.J.D.; Ipswich, 14.ii.1961, A. Diatloff; Didillibah, 1.xii.1960, H. G. Greening; Rockhampton, 4.x.1960, T. Passlow; Stanthorpe, 17.ii.1963, M. Bengston; Bli Bli, 14.viii.1964, J.J.D.; Nambour, 7.x.1964, J.J.D.; Walkamin, 1.vi.1966, R. J. Elder. *Phaseolus bracteatus* Nees and Mart, Indooroopilly, 11.vi.1965, J.J.D. *Physalis peruviana* L., Cape gooseberry, Manly, 12.ii.1960, B. R. Champ; Imbil, 15.xii.1960, A.R.B.; Montville, 16.vii.1963, D.A.I.; Nambour, 21.viii.1964, D.A.I.; Southport, 6.vi.1966, W. A. Smith *Pisum sativum* L., garden pea, Ayr, 19.ix.1960, J.J.D. *Poncirus trifoliata* (L.) Raf., trifoliate orange, Ayr, 8.iii.1961, J.J.D. *Quamoclit lobat*a House=*Mina lobata* Cerv., Gympie, 14.v.1966, K. G. Pegg. *Salvia officinalis* L., garden salvia, Atherton, 20.xi.1964, G. W. Saunders; Buderim, 14.iv.1966, D.A.I. *Senecio cruentis* DC., cineraria, Nambour, 10.ix.1964, D.A.I. *Sida* sp., Elimbah, 22.ii.1966, J. H. Barrett. *Tagetes minuta* L., stinking roger, Nambour, 15.iv.1966, J.J.D. *Tagetes* sp., marigold, Ayr, 25.vi.1959, J.J.D. *Teramnus uncinatus* (L.) Sw., Indooroopilly, 11.vi.1965, J.J.D. *Verbena* sp., Nambour 21.viii.1964, D.A.I. *Vigna marina* (Burm.f.) Merr., Indooroopilly, 11.vi.1965, J.J.D. *Xanthium pungens* Wallr., noogoora burr, Nambour, 7.iv.1966, D.A.I.

T. ludeni is distributed throughout coastal Queensland and is an important pest, favoured economic hosts being cotton, beans and strawberry.

(6) **Tetranychus marianae** McGregor

1950. *Tetranychus marianae* McGregor: Amer. Midl. Nat. 44(2):291.

The record of the occurrence of this species in Queensland is based on a single collection from the far north of the State. The form of the aedeagus is illustrated in Figure 1E. This species differs from *T. evansi* Baker and Pritchard, which has a similar aedeagus, in the structure of empodia I and II of the male. Insufficient material was available to enable the integumentary lobes of the female to be studied.

Host plant and locality.—QUEENSLAND: *Gossypium barbadense* L., cotton, Walkamin, 27.iv.1965, R. J. Elder.

(7) **Tetranychus neocaledonicus** André

1933. *Tetranychus neocaledonicus* André: Bul. Mus. Hist. Nat. Paris. (Sér. 2) 5:302.

Queensland specimens have dorsal integumentary lobes small, variable in size, semi-circular to broadly triangular with slightly dense tips and each with a basal spot. Ventral striae are almost entirely without lobes, except for a few which are scattered and obscure. The aedeagus, illustrated in Figure 1F, is of the kind figured by Baker and Pritchard (1960), and referred to by Boudreaux and Dose (1963*b*). No aedeagus has been observed shaped like that illustrated by Pritchard and Baker (1955) for *T. cucurbitae* Rahman and Sapra, which is generally believed to be synonym of *T. neocaledonicus*. Adult females are carmine or darker dull red.

Host plants and localities.—QUEENSLAND: *Acalypha wilkesiana* Muell. Arg., acalypha, Brisbane, Sept. 1957, A.R.B.; Redcliffe, 20.v.1965, J.J.D.; Buderim, 22.iii.1966, J.J.D. *Anona squamosa,* L., custard apple, Maryborough, 30.vii.1965, J.J.D.; Beerwah, 1.ix.1965, D.A.I. *Bauhinia* sp. bauhinia, Buderim, 28.viii.1964, D.A.I.; Zillmere, 2.vii.1965, J.J.D. *Cajanus cajan* (L.) Millsp., pigeon pea, Nambour, 10.v.1966, D.A.I., *Desmodium intortum* (Mill.) Urb., Atherton, 16.viii.1966, R. J. Elder. *Eustrephus latifolius* R.Br. ex Sims, a climbing lily, Maleny, 14.iv.1966, D.A.I.; Nambour, 27.v.1966, D.A.I. *Ficus fraseri* Miq., a sandpaper fig, Maleny, 14.iv.1966, D.A.I. *Ficus racemosa* L., cluster fig, Tuan, 11.v.1966, J.J.D. *Geitonoplesium cymosum* (R.Br.) A. Cunn. ex Hook., Ridgewood, 10.iii.1965, J.J.D.; Nambour, 27.v.1966, D.A.I. *Gossypium barbadense* L., cotton, Walkamin, 25.vi.1965, G. W. Saunders. *Hibiscus rosa-sinensis* L., Chinese hibiscus, Nambour, 18.iv.1966, D.A.I. *Holmskioldia sanguinea* Retz, Chinese-hat plant, Buderim, 28.viii.1964, D.A.I. *Lathyrus odoratus* L., sweet pea, Nambour, 19.viii.1964, D.A.I. *Legnephora moorei* (F. Muell.) Miers, wild grapes, Brisbane, 10.xii1959, I. C. Cunningham. *Passiflora foetida* L., stinking passion-flower, Palmwoods, 29.v. 1964, J.J.D. Nambour, 7.iv.1966, D.A.I. *Pseudomorus brunoniana* (Endl.) F. Muell., a whalebone-tree, Paradise, via Biggenden, 16.ii.1966, J.J.D. *Pueraria thunbergiana* (Siebold & Zucc.) Benth., kudzu, Nambour, 10.v.1966, D.A.I. *Rosa multiflora* Thunb., rose, Town Mt., Nambour 15.vi.1966, D.A.I. *Stenolobium stans* (L.) Seem., tecoma, Goodna, 14.v.1966, D.A.I.

T. neocaledonicus is widely distributed in coastal Queensland, often numerous on a large range of host plants of which no doubt many more will be recorded, but it does not appear to be an important pest species.

The Tetranychus telarius Species Complex

The complex of closely related species similar to *T. telarius* (L.) was revised by Boudreaux (1956). Of these species, two, referred to by Boudreaux as T. *telarius* (Linné 1758) and *T. cinnabarinus* (Boisduval 1867), are known to occur in Queensland. The nomenclature of these species is in question. Boudreaux and Dosse (1963*a*) considered that the name *T. telarius* (L.) should be applied to the carmine mite previously called by many authors *T. cinnabarinus* (Boisd.) and that the name *T. urticae* Koch should be applied to the two-spotted mite often referred to as *T. telarius* (L.). Boudreaux and Dosse (1963*c*) proposed this usage for consideration by the International Commission on Zoological Nomenclature. A counter proposal by Eyndhoven (1964), replied to by Boudreaux and Dosse (1966), would, if accepted, result in the application of the name *T. cinnabarinus* (Boisd.) to the carmine mite. It is intended here to use the nomenclature of Boudreaux and Dosse, namely *T. telarius* (L.), for the carmine mite and *T. urticae* Koch for the two-spotted mite. There are no reliable differences between these two species in the shape of the aedeagus, and the distinguishing features are to be found in the colour of the adult females, the colour of the eggs and the shape of the integumentary lobes.

(8) **Tetranychus telarius** (L.)

1758. *Acarus telarius* Linnaeus (partim): Systema naturae, Ed.10, 1:616.

Adult females are brownish red, with dark lateral spots and the eggs newly laid are amber coloured with a distinct reddish tinge. Dorsal integumentary lobes are relatively narrow and pointed to more broadly triangular. There are no ventral lobes. The aedeagus is illustrated in Figure 1G, and integumentary lobes in the region of the third dorso-central setae in Figure 1I.

T. telarius has so far in this study been positively identified from only one locality in Queensland.

Host plants and localities.—QUEENSLAND: *Viola odorata* L., violet, Nambour, May-June 1964, J.J.D. *Viola tricolor* L., pansy, Nambour, 23.ix.1964, D.A.I.

(9) **Tetranychus urticae** Koch

1836. *Tetranychus urticae* Koch: D. Crust. Myr. Arach., Fasc. 1:10.

Active adult females are green or yellowish with one large, usually trifid, food spot on each side; the eggs are clear white. Dorsal integumentary lobes are markedly larger and broader than in *T. telarius,* ranging from nearly semi-circular to oblong, with an occasional pointed lobe. The aedeagus is illustrated in Figure 1H, and integumentary lobes in the region of the third dorso-central setae in Figure 1J.

Bengston (1965) investigated the overwintering behaviour of *T. telarius* (L.) (*T. urticae* Koch as defined here) in the Stanthorpe district. He found that an orange or reddish winterform was produced, mainly by nutritional factors on senescing deciduous foliage. This represented a quiescent phase rather than a true diapause. Active two-spotted females continued feeding throughout the winter where suitable evergreen hosts were available.

Host plants and localities.—QUEENSLAND: *Carica papaya* L., papaw, Nambour, 5.x.1964, J.J.D., Brisbane, 4.i.1965, A.R.B. *Cucurbita maxima* Duchesne, pumpkin, Brisbane, 4.i.1965, A.R.B. *Dahlia* sp., dahlia, Sunnybank, 25.ii.1958, J.J.D.; Atherton, 15.xi.1965, R. J. Elder. *Fragaria* x *ananassa* Duchesne, strawberry, Kallangur, 10.vii.1964, L. W. Rigby; Thornlands, 23.ix.1964, J.J.D.; Rochedale, 5.iii.1965, L. W. Rigby. *Gladiolus* spp., gladiolus, Brisbane, 4.ii.1965, A.R.B. *Gossypium barbadense* L., cotton, Inglewood, 3.v.1957, A.R.B.; Forest Hill, 20.i.1965, J. W. Turner; Walkamin, 25.vi.1965, G. W. Saunders. *Holmskioldia sanguinea* Retz, Chinese-hat plant, Buderim, 24.viii.1966, D.A.I. *Lycopersicon esculentum* Mill., tomato, Ormiston, 20.xi.1964, L. W. Rigby. *Malus sylvestris* Mill., apple, Applethorpe, 19.iii.1957, M. Bengston. *Pennisetum purpureum* Schum., elephant grass, Nambour, 16.viii.1966, D.A.I. *Phaseolus vulgaris* L., French bean, Belmont, 2.xii.1964, J. H. Barrett; Bli Bli, 14.viii.1964, J.J.D. *Quamoclit lobata* House = *Mina lobata* Cerv., Brisbane, 4.i.1965, A.R.B. *Rosa multiflora* Thunb., rose, Bundaberg, 2.iv.1966, J.J.D. *Tropaeolum majus* L., nasturtium, Brisbane, 10.viii.1964, A.R.B.

T. urticae is a widespread pest species in Queensland, with a very wide range of host plants. The small number of records for which positive identifications are available reflects the confusion in earlier identifications.

Identification

Queensland species of the genus *Tetranychus* may be distinguished from other genera of spider mites by having the empodia consisting of only three pairs of proximoventral hairs, with the dorso-median claw very minute or absent (except in empodia I and II of males of some species), by having only one pair of para-anal setae, and by the two sets of duplex setae on tarsus I being well separated.

The following key does not include *T. desertorum,* but this species would key out into the *Desertorum* species group with *T. ludeni.* The aedeagus characters are difficult to describe briefly and the key should be used in conjunction with the drawings in Figure 1. Again excluding *T. desertorum* and also *T. marianae,* of which the cuticular lobes are not known, it is possible to distinguish the other seven species on female characters only. While this may provide correct determinations in many instances, the spider mites found in this country must be far better known before identifications based on females only can be made with confidence.

KEY TO QUEENSLAND SPECIES OF TETRANYCHUS

(1) Female with the proximal pair of duplex setae on tarsus I in line with the proximal four tactile setae (*Desertorum* species group); aedeagus with small knob without a posterior angulation but with a well marked anterior angulation ..... *ludeni*
Female with the proximal pair of duplex setae well beyond the proximal four tactile setae ..... (2)

(2) Dorsal striae transverse sometimes irregular between the third pair of dorso-central setae; females yellow with several dark spots along each side (*Pacificus* species group); aedeagus with knob narrow dorso-ventrally, with an acute anterior angulation and a very pronounced and elongated posterior angulation ..... *lambi*
Dorsal striae longitudinal between the third pair of dorso-central setae; females red, or green with a large dark spot on each side (*Telarius* species group) ..... (3)

(3) Knob of aedeagus rounded, without marked angulation .... *neocaledonicus*
Knob of aedeagus with a sharp anterior and/or posterior angulation .... (4)

(4) Knob of aedeagus small but elongate, its axis inclined at a large angle to that of the main shaft, with a small anterior angulation and a more marked posterior angulation ..... *marianae*
Knob of aedeagus with its axis more or less parallel to that of the main shaft or inclined to it at only a slight angle ..... (5)

(5) Aedeagus with knob large, rounded anteriorally, with a sharp posterior angulation ..... *hydrangeae*
Aedeagus with knob small or elongate, with anterior and posterior angulations ..... (6)

(6) Aedeagus with knob longer than wide, posterior angulation longer than anterior angulation, stem short; female with hook of peritreme weakly developed; ventral striae of hysterosoma lobed ..... *dianellae*
Aedeagus with knob about as long as wide, development of anterior and posterior angulations similar, female with hook of peritreme strongly developed, and without lobes on ventral hysterosomal striae (*Telarius* species complex) ..... (7)

(7) Females green*, with a large, well marked, usually trifid dark spot on each side; eggs clear white or yellowish; dorsal cuticular lobes mostly semi-circular to oblong ..... *urticae*
Females red or brownish red, usually with more diffuse lateral food spots; eggs with reddish tinge; dorsal cuticular lobes mostly narrow, tending to be triangular in shape ..... *telarius*

* Except the orange or reddish winterform as recorded on deciduous hosts in the Stanthorpe district (Bengston 1965).

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