

The Oriental Red Mite, *Eutetranychus orientalis* (Klein) (Acarina: Tetranychidae), in Australia

DAVID EVANS WALTER¹, R. B. HALLIDAY² and D. SMITH³

¹Centre for Tropical Pest Management and Department of Entomology, University of Queensland, Qld 4072.

²CSIRO Division of Entomology, G.P.O. Box 1700, Canberra, A.C.T. 2601.

³Queensland Department of Primary Industries, Nambour, Qld 4560.

ABSTRACT The oriental red mite, *Eutetranychus orientalis*, an important pest of citrus and other crops in many parts of the world, has been in Queensland for at least 30 years. We review Australian collections of oriental red mite, clarify confusion over its name and pest status, discuss its potential biological control agents, and provide a key to differentiate known Australian species of *Eutetranychus* and the African red mite, *E. africanus* (Tucker).

Introduction

The oriental red mite, *Eutetranychus orientalis* (Klein) (Acarina: Acariformes: Tetranychidae), is an important pest of citrus in the Middle East, Africa and Asia (Jeppson *et al.* 1975). Specimens morphologically identical to *E. orientalis* (Meyer 1974, 1987), including the lateral aspect of the aedeagus of the male, began appearing in Queensland in the early 1960s and are now known from throughout northern Queensland. Oriental red mite is a common, but usually minor, pest of citrus in the Central Burnett and coastal citrus growing regions, but it is a serious pest in citrus around Emerald (Smith 1990; Smith *et al.* 1994) and can be a serious pest of glasshouse plants. Most outbreaks in citrus appear to be related to the use of insecticides in orchards or to aerial drift from cotton fields (D. Smith pers. obs.).

Species of *Eutetranychus* are true spider mites (Tetranychinae), but use silk only to produce a protective cover over their eggs (Gutierrez and Helle 1985). The genus may be distinguished from other Tetranychinae (e.g. *Tetranychus*, *Panonychus*) by its lack of duplex setae on tarsus I and by the reduction of the empodium to a minute nub. We here provide a key to the known Australian species of *Eutetranychus* and to an exotic species of potential pest importance, diagnose *E. orientalis*, and briefly consider the hosts and potential control agents for the species. We also provide a synonymy and bibliography for the species, to provide access to the relevant literature and to settle confusion about names. Voucher specimens are deposited in the University of Queensland Insect Collection, St Lucia, the Queensland Department of Primary Industries Insect Collection, Indooroopilly, and the Australian National Insect Collection, Canberra.

Key to the Adult Females of *Eutetranychus*

1. Dorsocentral setae of hysterosoma very long, passing insertions of next seta in series, and tapering to a point. *E. pantopus* (Berlese)
Dorsocentral setae shorter, blunt or spatulate
..... 2

2. Dorsocentral setae long, rod-like; tibia II with 7 setae *E. acaciae* Miller
Dorsocentral setae short, spatulate to subspatulate; tibia II with 6 setae 3
3. Coxa II with 2 setae; spermatheca rounded
..... *E. africanus* (Tucker)
Coxa II with 1 seta; spermatheca pointed distally *E. orientalis* (Klein)

Eutetranychus orientalis (Klein)

Anychus orientalis Klein, 1936: 3; Sayed, 1946: 143.
Anychus ricini Rahman and Sapra, 1940: 194.
Eutetranychus monodi André, 1954: 859; Gutierrez, 1977: 476.
Eutetranychus orientalis (Klein): Baker and Pritchard, 1960: 464; Meyer and Rodrigues, 1966: 14; Attiah, 1967: 15; Gutierrez and Helle, 1971: 45; Meyer, 1974: 138, 1987: 80; Jeppson *et al.*, 1975: 153; Gupta, 1985: 66; Tseng, 1990: 25; Smith, 1990: 10.
Eutetranychus sudanicus Elbadry, 1970: 301.
Eutetranychus anneckeii Meyer, 1974: 148.
Eotetranychus (sic) *orientalis* (Klein): Brough *et al.* 1994: 65.

Collections. QUEENSLAND: Cooktown from citrus, 12.x.1963 (QDPI N3155); Lower Wonga from citrus, 10.iii.1965 (QDPI N1417), from *Casuarina cunninghamii*, 2.ii.1965 (QDPI N1389); Kamerunga from durian in glasshouse, 7.ii.1987; Yarwun from custard apple, 28.vi.1987; R. Elder; Emerald from orange, 2.x.1991 (QDPI L1407), 13.x.1991 (QDPI L1406); Townsville from *Toona ciliata* and *Cedrela odorata* in glasshouse, v.1994, M. Webb.

Diagnosis. Genu III with 2 setae; tibia II with 6 setae; coxa II with 1 seta; dorsocentral setae *c1, d1, e1, f1, h1* spatulate to subspatulate; spermatheca pointed distally; integument striate with minute tubercles, striae longitudinal on prodorsum, longitudinal to V-shaped between hysterosomal setae *d1-e1*.

Discussion

Eutetranychus orientalis has at times been separated from other putative species such as *E. anneckeii* and *E. monodi* by the pattern of striation of the dorsal cuticle. However, it has now been shown that this character is variable within species, and both longitudinal and V-shaped patterns of striation occur together in interbreeding populations (Meyer 1987). Oriental red mite is also variable in the length and degree of pubescence

of its dorsal idiosomal setae. The African red mite, *E. africanus* (Tucker), attacks many of the same crops as oriental red mite (Jeppson *et al.* 1975), but is not yet known to occur in Australia. African red mite differs from oriental red mite in having two setae on coxae II, a rounded spermatheca in the female, and in the male, the distal bent portion of the aedeagus being shorter than the relatively straight dorsal margin (Meyer 1987).

Hosts. Oriental red mite is principally a pest of citrus, but has also been reported to attack a wide variety of other plants, including banana, cassava, castor bean, cotton, fig, frangipani, maize, mulberry, oleander, peach, plum, rose, squash, grape, pawpaw, pear, quince, walnut, *Albizia harveyi*, *Anacardium virdis*, *Ananas comosus*, *Annona squamosa*, *Azadiracta indica*, *Bauhinia variegata*, *Cassia fistula*, *Cedrela odorata*, *Chenopodium vulgare*, *Croton* sp., *Dalbergia sisso*, *Eucalyptus globulus*, *Euphorbia* sp., *Glyricedia* sp., *Grewia villosa*, *Melia azedarach*, *Nerium indicum*, *Peltophorum africanum*, *Phragmites australis*, *Punica granatum*, *Solanum melongena*, *Sorbus domestica*, *Tabernaemontana coronaria*, *Thevetia peruviana*, *Trema orientalis*, *Toona ciliata*, and *Zizyphus jujuba* (Gupta 1985; Jeppson *et al.* 1975; Meyer 1987; herein).

Predators. Like the citrus red mite *Panonychus citri* (McGregor), *E. orientalis* produces little webbing and tends to feed on the upper surface of the leaf. McMurtry (1985) suggested that predators that attack *P. citri* (e.g. *Stethorus* beetles; *Euseius* and *Amblyseius* mites) may also be effective against oriental red mite. In Israel, *Euseius rubini* Swirski and Amitai and *E. hibisci* Chant both reproduced when fed only on oriental red mite (Swirski *et al.* 1967, 1970). In India, phytoseiid mites (including species of *Euseius*, *Neoseiulus*, and *Typhlodromus*), a stigmatid mite (*Agistemus* sp.), a tydeid mite (*Pronematus* sp.), a thrips (*Scolothrips indicus* Priesner), and coccinellid beetles (*Stethorus* sp., *Scymnus gracilis* Motsch) are reported to prey on oriental red mites attacking citrus (Gupta 1985). The main predators of oriental red mite in Queensland citrus groves are *Stethorus histrio* Chazeau and *Euseius victoriensis* (Womersley). The latter (often referred to the genus *Amblyseius*) is also an important predator of citrus rust mites (Smith and Papacek 1991) and of two-spotted mite (James 1990).

Acknowledgment

We thank Mike Webb, CSIRO Division of Soils, Townsville, for being inquisitive about the mites attacking his trees.

References

- ANDRÉ, M. (1954). Tétranyche nouveau, parasite de *Cassia siamea* Lam. et *Grewia mollis* Juss., à Dakar. Bull. Inst. Fr. Afr. N. (Ser. A) 16: 859-861.
- ATTIAH, H. H. (1967). The genus *Eutetranychus* in U. A. R., with description of three new species (Acarina: Tetranychidae). Bull. Soc. Ent. Égypte 51: 1-16.
- BAKER, E. W. and PRITCHARD, A. E. (1960). The tetranychoid mites of Africa. Hilgardia 29: 455-574.
- BROUGH, E. J., ELDER, R. J. and BEAVIS, C. H. S. (Eds). (1994). Managing Insects & Mites in Horticultural Crops. Information Series Q194010, Department of Primary Industries, Queensland: Brisbane.
- ELBADRY, E. A. (1970). A new species of tetranychid mite from Sudan (Acarina: Tetranychidae). Rev. Zool. Bot. Afr. 82: 301-305.
- GUPTA, S. K. (1985). Plant mites of India. Zoological Survey of India: Calcutta.
- GUTIERREZ, J. (1977). Un acarien nuisible aux arbres fruitiers, en Afrique occidentale: *Eutetranychus monodi* André (Tetranychidae). Acarologia 18: 475-481.
- GUTIERREZ, J. and HELLE, W. (1971). Deux nouvelles espèces du genre *Eutetranychus* Banks (Acariens: Tetranychidae) vivant sur plantes cultivées à Madagascar. Ent. Berichten 31: 45-60.
- GUTIERREZ, J. and HELLE, W. (1985). Evolutionary changes in the Tetranychidae. In Helle, W. and Sabelis, M. W. (Eds). Spider Mites, Their Biology, Natural Enemies, and Control, pp. 91-107. Elsevier: New York.
- JAMES, D. G. (1990). Biological control of *Tetranychus urticae* in southern NSW peach orchards: The role of *Amblyseius victoriensis* Aust. J. Zool. 37: 645-655.
- JEPPSON, L. R., KLEIFER, H. H. and BAKER, E. W. (1975). Mites Injurious To Economic Plants. University of California Press: Berkeley.
- KLEIN, H. Z. (1936). Contributions to the knowledge of the red spider in Palestine. Bull. Isr. agr. res. Sta. 21: 1-63.
- McMURTRY, J. A. (1985). Citrus. In Helle, W. and Sabelis, M. W. (Eds). Spider Mites, Their Biology, Natural Enemies, and Control, pp. 339-347. Elsevier: New York.
- MEYER, M. K. P. (SMITH). (1974). A revision of the Tetranychidae of Africa (Acari). Ent. Mem. Dept. Agr. Tech. Ser. Rep S. Afr. 36: 1-291.
- MEYER, M. K. P. (SMITH). (1987). African Tetranychidae (Acari: Prostigmata). Ent. Mem. Dept. Agr. Tech. Ser. Rep S. Afr. 69: 1-175.
- MEYER, M. K. P. (SMITH) and RODRIGUES, M. C. (1966). Acari associated with cotton in southern Africa. *Garcia de Orto* 13 (3): 1-33.
- RAHMAN, K. A. and SAPRA, A. N. (1940). Mites of the family Tetranychidae from Lyallpur with descriptions of four new species. Proc. Ind. Acad. Sci. 11: 177-196.
- SAYED, M. T. (1946). The genus *Anychus* McGregor in Egypt and the Sudan. Bull. Soc. Faoud 1er Ent. 30: 143-148.
- SMITH, D. (1990). Integrated pest management in Queensland citrus. Aus. Citrus News, December 1990. pp. 6-12.
- SMITH, D., BEATTIE, A., ALTMANN, J., JAMES, D. and BUCHANAN, G. (1994). Pest management. In Citrus Pests and Diseases: Quality Management Guide for Field Operations. Australian Horticulture Corporation, NSW Agriculture: Sydney.
- SMITH, D. and PAPACEK, D. F. (1991). Studies of the predatory mite *Amblyseius victoriensis* (Acarina: Phytoseiidae) in citrus orchards in south-east Queensland: control of *Tegolophus australis* and *Phyllocoptura oleivora* (Acarina: Eriophyidae), effect of pesticides, alternative host plants and augmentative release. Exp. appl. Acarol. 12: 195-217.
- SWIRSKI, E., AMITAI, S. and DORZIA, N. (1967). Laboratory studies on the feeding, development and reproduction of the predacious mites *Amblyseius rubini* Swirski and Amitai and *Amblyseius swirskii* Athias (Acarina: Phytoseiidae) on various kinds of food substances. Isr. J. agri. Res. 17: 213-218.
- SWIRSKI, E., AMITAI, S. and DORZIA, N. (1970). Laboratory studies on the feeding habits, post-embryonic survival and oviposition of the predacious mites *Amblyseius chilensis* Dosse and *Amblyseius hibisci* (Chant) on various kinds of food substances. Entomophaga 15: 93-106.
- TSENG, Y. H. (1990). A monograph of the mite family Tetranychidae (Acarina: Trombidiformes) from Taiwan. Taiwan Mus. Sp. Publ. Ser. 9: 1-224.