

MORPHOLOGY AND NATURAL ENEMIES OF OF *TINOCALLIS KAHAWALUOKALANI* (KIRKALDY) (HOMOPTERA: APHIDIDAE) FROM PUNJAB, PAKISTAN

Imran Bodlah, Muhammad Naeem and Tasleem Akhter

Department of Entomology, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, Pakistan

ABSTRACT

Tinocallis kahawaluokalani (Kirkaldy) (Homoptera: Aphididae) is recorded from Pothohar tract of Punjab Province of Pakistan from different localities on *Lagerstroemia indica* L. A taxonomic note along with necessary measurements is discussed. Drawings of important characters are given. Its host range, world distribution and distribution in Pakistan have been given. Information regarding the natural enemies of this aphid pest has also been given.

Keywords: *Tinocallis kahawaluokalani*, Morphology, Natural enemies, Pakistan

INTRODUCTION

Aphids (Homoptera, Aphididae) are one of the major pests in ornamental plants (Arruda et al., 1996; Clements et al., 2000). They may cause damage to plants directly by sucking their sap, and indirectly by injecting toxic salivary secretions, transmitting pathogens, attracting ants and favoring the development of sooty-mold (Lara 1992, Zucchi et al., 1993). *Tinocallis kahawaluokalani* cause an unsightly gray to black film to cover the tree and objects below the tree, thus, detracting from its ornamental qualities (Doughty et al., 1992).

It has been reported from North America (Richards 1967, Smith and Parron 1978), Hawaii (Zimmerman 1948), Thailand (Banziger and Hengsawad 1985), China, Taiwan, Japan (Zimmerman 1948, Richards 1967) and India (Agarwala et al.1989). Currently, it has been reported from various other countries like Argentina (Alfonsina, 2008), Brazil (Lúcia et al., 2002), Mexico (Trejo-Loyo et al., 2004) and Greece (Tsitsipis et al., 2007).

A lot of work in addition to its occurrence in the world has been done up till now like unsuccessful search for parasites (Mizell et al., 2002) and control of this pest by various techniques (Pettis et al., 2005 and Doughty et al.,1992). But to low level of basic research in Pakistan in relation to insect pests of ornamental plants specially, this species was not recorded yet. During our surveys in 2007-2009, we collected many samples of this pest from *Lagerstroemia indica*.

Aphids were collected either by removing them with an ordinary camel-hair brush or by jarring the plants on white paper sheets from Crape myrtle. Specimens were collected from, Islamabad, Rawalpindi, and Taxilla during 2009. The large sized adults were then killed, preserved in 70 percent alcohol in vials and properly labeled. Slides were made for identification by standard method (Blackman and Eastop 1984).

Aphids were observed under Swift sm-80 binocular microscope. The illustrations were prepared using a Nikon microscope (SMS-1500, with 30x 1-11.25x magnification). The measurements of taxonomically important parts of identified specimens were taken with an ocular and stage micrometer. The specimens were identified up to specific level by using the keys of Blackman & Eastop (1984).

RESULTS AND DISCUSSION

Tinocallis kahawaluokalani (Kirkaldy) (Homoptera: Aphididae) (Fig. 1-5)

Myzocallis kahawaluokalani Kirkaldy, 1907. Pro. Hawaii ent. Soc. 1:101.

Fig. (1)

Taxonomic note

Alate

Body broad, elongated, pale to bright yellow, with dark sclerotic rows of pigmented tubercles bearing capitate hairs. Head is narrower than thorax. Head and thorax devoid of spinal tubercles. Eyes pinkish in color; transverse eye length is twice the width. Head and prothorax covered with dark longitudinal strips and pterothorax with dark brown strips. Antennal

*Corresponding author: e-mail: imranbodlah@gmail.com

tubercles are not well developed. Antennae 0.53 times as long as body, scape pedicle and proximal end of each antennal segment are darker in coloration, remainder of the antennae light yellowish. Antennal segment 3 about 1.5 times longer than 4 and 5 and about 1.4 times than 6th segment. In the case of apterae, antennal segment 3 about similar in length to lost segment and about 1.3 times the remaining segments. Terminal process as long as base of the last antennal segment.

Spinal tubercles on tergite 2 are large, about 0.14-0.15 in height, medially fused to form a dark sclerotic transverse band. Spinal tubercles on tergite 2 are united over more than half of their length. Wing that are held roof like over the body, are strongly pigmented, dark over stigmal and costal areas and at base. Tips of veins pigmented.

Ultimate rostral segment almost equal to segment 2 of hind tarsus and with 6-8 hairs not even reaching the for coxae. Abdomen with paired spinal process on anterior tergites with

well developed lateral tubercles (.04-.08 mm) in length bearing one hair each. Siphunculi darker, small, smooth and about equal in length and width. Cauda knobbed with 8-9 hairs.

Alate

Length of body 1.65, width 0.79; antennal segments III: IV: V: VI 0.31: 0.21: 0.21:0.22; ultimate rostral segment. 0.07 Siphunculi 0.03; cauda 0.09.

Aptera

Length of body 1.62, width 0.85; antennal segments III: IV: V: VI 0.20: 0.15: 0.15:0.20; ultimate rostral segment 0.060; cauda 0.07.

Nymph

Pale to bright yellow in coloration with black spike or hair like projections on their abdomen. They lack black spots and two large black tubercles on the dorsal surface of the abdomen

Material examined

Rawalpindi, 28.06.09, 14 alate and 12 aptera; Islamabad, 04.07.09, 3 alate and 1 aptera; Taxilla, 21-7-09, 5 alate and 2 aptera.





Morphology of *Tinocallis kahawaluokalani* Figure 1.a: Spinal tubercles on tergite 2; b: Dorsal view of alate showing forewing;c: Forewing venation; d: Cauda; e: Dorsal view of aptera

REMARKS

Extensive survey during year 2007-08 on searches for parasitic Hymenoptera of crape myrtle aphid was also done. We found no parasitic Hymenoptera. A parasite-free situation is unusual among the foliar-feeding Aphididae. Cameroon, Jamaica, Malaysia, Mexico, People's Republic of China, Philippines, Puerto Rico, Thailand and United States have been surveyed; no parasitic Hymenoptera was found (Mizell et al., 2002). Our results were also same for this species of aphids in Pakistan. Only various lady bird beetles and *Chrysop* sp. were found as natural enemies of this aphid during our surveys.

REFERENCES

- Agarwala BK, Mahapatra SK, Ghosh AK, 1989. Description of sexual morphs of *Tinocallis kahawaluokalani* (Kirkaldy) (Homoptera: Aphididae) from India. *Entomon* 14: 273-274.
- Alfonsina S, 2008. Aphididae (Hemiptera) on ornamental plants in Córdoba (Argentina). *Rev. Soc. Entomol. Argent.* 67 (1-2): 49-56
- Arruda ST, Olivette MP, Castro CE, 1996. Diagnostico da floricultura do Estado de Sao Paulo. *Rev. Bras. Hort. Ornam.* 2: 1-18.
- Banziger H, Hengsawad V, 1985. Species spectrum, abundance and potential importance of aphids caught by yellow pan traps in experimental soybean plots in northern Thailand. *Thai J. Sci.* 18: 123-135.
- Blackman RL, Eastop VF, 1994. Aphids on the World's Trees: An Identification Guide. C. A. B. International, Wallingford, 987 p.
- Clements KM, Sorenson CE, Wiegmann BE, Roe M, 2000. Insecticide resistance in the *Myzus persicae* complex (Homoptera: Aphididae) with emphasis on tobacco pest management. *Rev. Toxicol.* 3: 1-23.
- Doughty SC, Pollet DK, Constantin RJ, Wells DW, Koonce KL, 1992. Paint-on application of acephate for aphid control on crape myrtle. *J. Arboric.* 18(2): 94-97.
- Lara FM, 1992. Princípios de entomologia. Ícone, São Paulo. 331 p.
- Lúcia A, Peronti BG, Sousa-Silva CR, 2002. Aphids (Hemiptera: Aphidoidea) of ornamental plants from São Carlos, São Paulo state, Brazil. *Rev. Biol. Trop.* 50(1): 137-144.
- Mizell FR, Fred BD, David RK, 2002. Unsuccessful search for parasites of the crape myrtle aphid, *Tinocallis kahawaluokalani* (Homoptera: Aphididae). Florida. *Entomol.* 85(3):521-523.
- Pettis VG, Braman SK, Guillebeau LP, Sparks B, 2005. Evaluation of Insecticides for Suppression of Japanese Beetle, *Popillia japonica* Newman, and Crape myrtle Aphid, *Tinocallis kahawaluokalani* Kirkaldy. *J. Environ. Hort.* 23(3):145-148.
- Richards WR, 1967. A review of the *Tinocallis* of the world (Homoptera: Aphididae). *Can. Entomol.* 99: 536-553.
- Smith CF, Parron CS, 1978. An annotated list of Aphididae (Homoptera) of North

- America. North Carolina Agric. Expt. Stat. Tech. Bull. 255.
- Trejo-Loyo AG, Pena-martinez R, Villegas-Jimenez N, 2004. Afidofauna (Hemiptera: Aphididae) De Cuernavaca, Morelos, Mexico. *Folia Entomol. Mex.*, 43(2) 191-202.
- Tsitsipis JA, Nikos KI, John MT, Dionyssios LP, Apostolos AD, Ioanna G, Kostas ZD, Dionyssios PC, Aristides P, 2007. A contribution to the aphid fauna of Greece. *Bulletin of Insectology*. 60 (1): 31-38.
- Zimmerman EC, 1948. *Insects of Hawaii*. Vol. 5. Homoptera: Sternorrhyncha. University of Hawaii Press.
- Zucchi RA, Neto SS, Nakano O, 1993. Guia de identificação de pragas agrícolas. Fundação de Estudos Agrários “Luiz de Queiroz”, Piracicaba, Brasil. 139 p.