A comparison of the diurnal flight pattern of two triatomine bugs Triatoma infestans and Triatoma sordida (Heteroptera : Reduviidae)

Autor(en): **McEwen, P.K.**

Objekttyp: **Article**

Zeitschrift: **Mitteilungen der Schweizerischen Entomologischen Gesellschaft = Bulletin de la Société Entomologique Suisse = Journal of the Swiss Entomological Society**

Band (Jahr): **67 (1994)**

Heft 3-4

PDF erstellt am: **04.06.2024**

Persistenter Link: https://doi.org/10.5169/seals-402575

MITTEILUNGEN DER SCHWEIZERISCHEN ENTOMOLOGISCHEN GESELLSCHAFT
BULLETIN DE LA SOCIÉTÉ ENTOMOLOGIQUE SUISSE
67, 453 – 455, 1994

A comparison of the diurnal flight pattern of two triatomine bugs *Triatoma infestans* and *Triatoma sordida* (Heteroptera: Reduviidae)

P.K. McEWEN

School of Pure & Applied Biology, PO Box 915, Cardiff CF1 3TL, United Kingdom

The untethered diurnal flight patterns of two species of triatomine bugs were recorded on video. Overall levels of flight activity were very similar and strongly nocturnal in both species. *Triatoma sordida* was exclusively nocturnal whilst *Triatoma infestans* showed low levels of daytime flight activity.

Keywords: Flight pattern, behavior, *Triatoma infestans, Triatoma sordida.*

INTRODUCTION

Triatomine bugs are the vectors of South American trypanosomiasis (Chagas' disease). Due to the lack of effective drugs and vaccines, control of this disease relies on spraying bug infested houses with appropriate insecticides. *Triatoma infestans* is the most wide-spread and best adapted domestic species of triatomine bug and sylvatic populations are rare (BARRETT, 1975; MINTER, 1975; SCHOFIELD, 1988). Such domestic specialization makes this species peculiarly vulnerable to control and complete eradication is seen as feasible (SCHOFIELD, 1988). Following the eradication of *T. infestans*, species of triatomine bugs with sylvatic populations may exploit the vacant domestic niche. One such species, *T. sordida*, is found in Bolivia, Brazil, and Argentina (MINTER, 1975).

Although it is known that bug movement from one region to another occurs passively (e.g. NEGHME *et al.*, 1960), both *T. infestans* and *T. sordida* are able to fly (LEHANE & SCHOFIELD, 1982; SCHWEIGMANN *et al.*, 1988; McEWEN, 1991; McEWEN & LEHANE, 1993; SCHOFIELD *et al.*, 1991, 1992) and it is likely that flight contributes to local colonisations (SCHOFIELD & MATTHEWS, 1985; JEDWAB, 1987). A clear understanding of the flight behaviour of these bugs is thus an important part of vector control.

As part of a wider investigation into the flight behaviour of triatomine bugs a comparison was made between the diurnal flight patterns of *T. sordida* and *T. infestans*.

MATERIALS AND METHODS

Bugs were placed in the flight column described by McEWEN (1991). This consisted of an 18 cm long, 1 cm diameter, wooden pole, glued to the centre of a 0.2 cm thick perspex sheet measuring 22 cm square. This fitted through a circular hole of 20 cm diameter cut in a 30 cm square, 2 cm thick, piece of chipboard. A 74 cm open ended cylinder of clear perspex tubing 20 cm in diameter fitted exactly through the hole in the chipboard and rested on the perspex sheet, with the wooden pole sticking up into the tube. Several pieces of folded filter paper were placed in the base of the column to act as a refuge for the bugs. A time lapse video was used to observe flight initiations.

A flight initiation was defined as a bug climbing the wooden pole and flying from the top. By playing back the video a record was made of how many bugs initiated flight at different times of day. A red 15 Watt light was used to provide sufficient night time illumination to operate the video.

In the first part of the experiment 14 male and 14 female T. infestans were placed in the flight column and videoed over a 3 weeks period. Subsequently 10 male and 10 female T. sordida were placed in the flight column and videoed on two successive nights of two successive weeks. Dead bugs were replaced weekly.

Experiments were run in a controlled temperature room at 28-30 °C, 40-60 % RH, L:D 12:12, and with a 'daytime' light intensity of 2500 Lux.

RESULTS AND DISCUSSION

Fig. 1 shows flights per bug day recorded each hour for the two species of bugs. A bug day is defined as one bug being in the experiment for one day and compensates for the differences in bug number and observation time allowed for each species. It is important to realise that these are crude data and do not take account of nutritional status. Nutritional status as measured by weight/length (W/L) ratio is known to be an important factor in determining the proportion of bugs initiating flight in both *T. infestans* (LAEHANE & SCHOFIELD, 1982) and *T. sordida* (MCEWEN, 1991, MCEWEN & LEHANE, 1993). In addition the fact that dead bugs were only replaced weekly means that the exact number of living bugs present at any one time is not known.

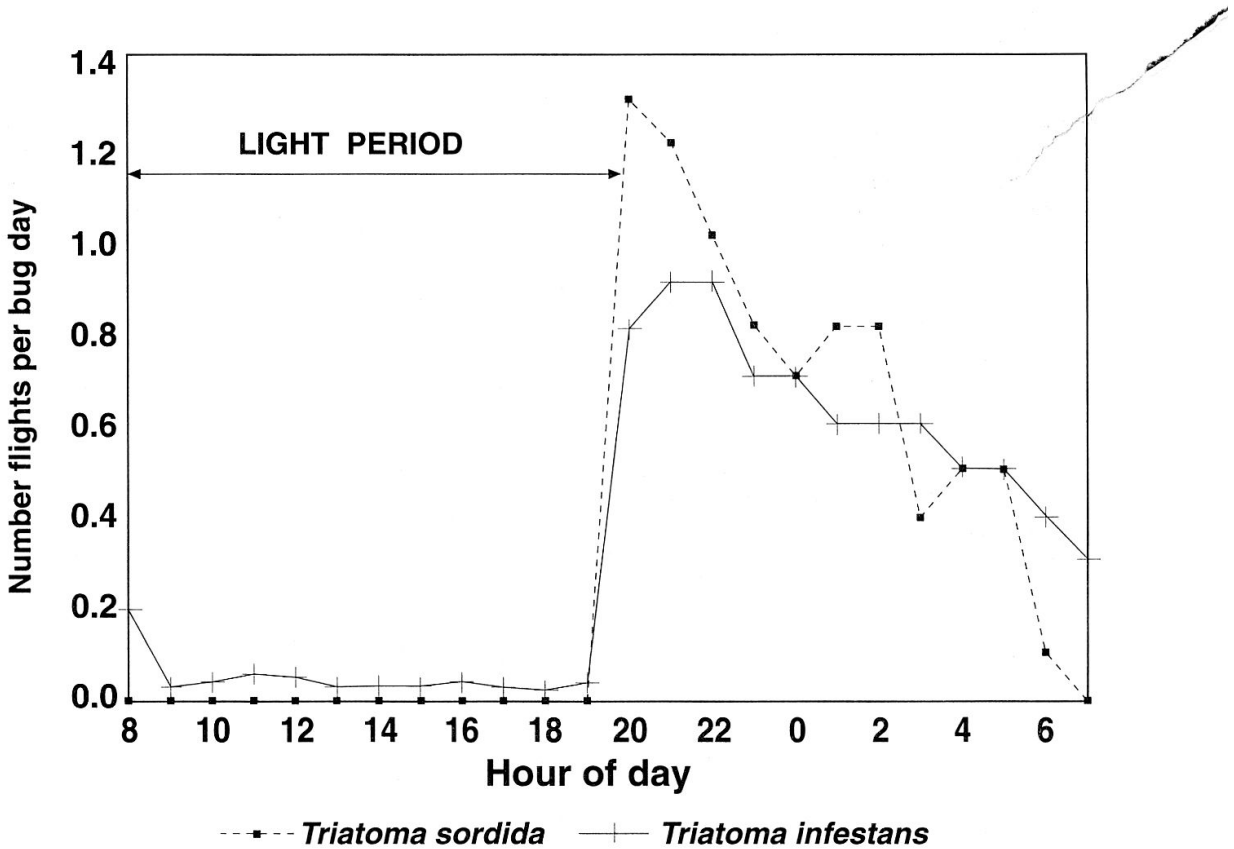

Fig. 1. Diurnal flight pattern of the two triatomine bugs *Triatoma infestans* and *Triatoma sordida*.

Despite this it can be seen that in general the two species made remarkably similar numbers of flights. Both species showed a strongly nocturnal unimodal flight pattern beginning with the onset of scotophase. In the case of *T. infestans* this confirms the work of LEHANE & SCHOFIELD (1982) and SETTEMBRINI (1984). The figure indicates that whereas *T. sordida* was strictly nocturnal, *T. infestans* makes a small number of flight initiations during the day.

SCHOFIELD *et al.* (1991) and MCEWEN & LEHANE (1993) have previously demonstrated the potential for flight in *T. sordida*. This present work shows that this species is as active an initiator of flight as *T. infestans*. Although this study does not look at flight distances the potential for *T. sordida* to actively colonise via flight is obvious and this area deserves further study.

ACKNOWLEDGEMENTS

I wish to thank Dr David GORLA for the supply of *T. sordida* and *T. infestans* eggs, Ann PENNELL for assistance with maintenance of the colony, Mike LEHANE for general advice and the Wellcome Trust for financial support.

REFERENCES

BARRETT, T.V. 1975. Parasites and predators of Triatominae. *In*: *New Approaches In American Trypanosomiasis Research*. Proceedings of an international symposium. Pan. Am. Health Organ. Sci. Publ. No. 318.

JEDWAB, J. 1987. *A model of active and passive dispersal of Triatoma infestans between houses*. Msc thesis, Cambridge.

LEHANE, M.J. & SCHOFIELD, C.J. 1982. Flight initiation in *Triatoma infestans* (KLUG) (Hemiptera: Reduviidae). *Bull. Ent. Res. 72:* 497-510.

MCEWEN, P.K. 1991. *Flight capacity of triatomine bug vectors of chagas disease*. University Of Wales Bangor. PhD Thesis, Chapter 7.

MCEWEN, P.K. & LEHANE, M.J. 1993. Factors influencing flight initiation in the triatomine bug *Triatoma sordida*. *Insect Sci. Applic. 14(4):* 461-464.

MINTER, D.M. 1975. Feeding patterns of some triatomine vector species. *In: New Approaches In American Trypanosomiasis Research*. Proceedings of an international Symposium. Pan. Am. Health Organ. Sci. Publ. No. 318.

NEGHME, A., SCHEHONE, H., REYES, H., CARRASCO, J. & ALFARO, E. 1960. Hallazgo de *Triatoma infestans* en vagones de ferrocarril. *Boln Chil. Parasitol. 15:* 86-87.

SCHOFIELD, C.J., 1988. Biosystematics of the Triatominae. *In*: M.W. SERVICE (ed.), *Biosystematics Of Haematophageous Insects*. Systematics Assoc. Clarendon Press, Oxford.

SCHOFIELD, C.J. & MATTHEWS, J.N.S. 1985. Theoretical approach to active dispersal and colonization of houses by *Triatoma infestans*. *J. Trop. Med. Hyg. 88:* 211-222.

SCHOFIELD, C.J., LEHANE, M.J., MCEWEN, P.K., CATALA, S.S. & GORLA, D.E. 1991. Dispersive flight by *Triatoma sordida*. *Trans. R. Soc. Trop. Med. Hyg. 85:* 676-678.

SCHOFIELD, C.J., LEHANE, M.J., MCEWEN, P.K., CATALA, S.S. & GORLA, D.E. 1992. Dispersive flight by *Triatoma infestans* under natural climatic conditions in Argentina. *Med. Vet. Ent. 6:* 51-56

SCHWEIGMANN, N., VALLVE, S., MUSCIO, O., GHILLINI, N., ALBERTI, A. & SCHWEIMANN, C. 1988. Dispersal flight by *Triatoma infestans* in an arid area of Argentina. *Med. Vet. Ent. 2:* 401- 404.

SETTEMBRINI, B.P. 1984. Circadian rhythms of locomotor activity in *Triatoma infestans* (Hemiptera: Reduviidae) *J. Med. Ent. 21(2):* 204-212.

(received August 22, 1994; accepted September 21, 1994)