

Nota Científica

**RECORDS OF PREDATORS AND PARASITES (VERTEBRATES AND INVERTEBRATES) OF
CREOSOTE BUSH GRASSHOPPER *BOOTETTIX ARGENTATUS* BRUNER, 1889,
(ORTHOPTERA: ACRIDIDAE: GOMPHOCERINAE) FROM THE BOLSÓN DE MAPIMI, DGO.
(CHIHUAHUAN DESERT), MEXICO**

Abstract. This paper summarizes unpublished information and isolated field observation records on the principal predators (9 vertebrates, 10 insect and 2 orb weaver and a terrestrial spider species) and parasites (an insect and one mite species) of *B. argentatus* a non economic, highly specialized monophagous grasshopper species of creosote bushes *Larrea tridentata* in Mapimi Biosphere Reserve, a southern region of the Chihuahuan Desert.

The grasshopper *Bootettix argentatus*, is a monophagous species (Ball 1936, *Econ. Ent.* 29:679-684; Uvarov 1977. *Grasshopper and Locusts. A Handbook of General Acridology. C. O. P. R. London*), restricted to living and feeding on creosote bush (*Larrea tridentata*) (DC) Cov. (Zygophyllaceae), during all its life (Isely 1944, *Ann. Ent. Soc. Amer.* 37:47-67; Otte & Joern 1977, *Proc. Acad. Nat. Sci. Phila.* 128:89-126; Joern 1979. *Trans. Amer. Ent. Soc.* 105:253-300). It occasionally chews on some grasses but does not ingest them (Chapman 1988, *In: Chapman, R. F. and A. Joern. Eds. Biology of Grasshoppers. John Wiley & Sons. USA. Pags 39-72*). The species is widespread in arid lands in USA, and Mexico, and its distribution closely matching to its host plant (Appendix 1).

The high diet specialization increases the physiological efficiency of this species but can reduce its defensive behaviour against predators and its dispersion capacity (Staddon & Gendron 1983. *Amer. Nat.* 122:843-848; Moran 1986. *Ecology.* 67:108-115).

Some years they exhibit densities as high as 30 ind/bush (Thinkham 1948, *Amer Midl. Nat.* 40:521-663; Otte 1981, *The North American Grasshoppers, Vol. 1. Harvard University Press. USA*) and population densities ranging from 300 to 700 ind/ha (Mispagel 1978, *Ecology.* 59:779-788); the grasshopper population can be found around 30% of the creosote bushes observed (N=300, Rivera 1996, *Acta Zool. Mex. N. S.* 68:1-12), and they can be observed during most of the year, with the highest abundance observed between August and December (Rivera 1986, *Acta Zool. Mex. N. S.* 14:1-42).

The Hairston *et al* paper on community structure, population control and competition (1960. *Amer. Nat.* 94:421-425), demonstrated the importance of food webs. Root and his students (1973, *Ecol. Monogr.* 43:95-124), further examined some important interactions in insect communities, showing predation as an important control agent on herbivorous insects, affecting the competition between species in the same trophic level and their effect on primary producers. Bernays and Graham, (1988, *Ecology.* 69:886-892) state that herbivores' natural enemies are a strong selection pressure resulting in a decrease in the host numbers.

From 1930 to 1955, research efforts on insect predators and parasites were focused on biological control of economic pest species. This interest has been renewed in the last decade due to the controversy generated by the use of exotic agents used in Integrated

Pest Management Programs. To that end, extensive lists of predators and parasites of economic pest grasshoppers have been generated (Mason & Erlandson 1994, *The Can. Ent.* 126:1459-1491).

In this paper I present an annotated list of 22 species of predators and 2 species of parasites of the grasshopper *Boottettix argentatus* in the Mampimi Biosphere Reserve.

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Appendix 1

Records of predators and parasites (Vertebrates and Invertebrates) of creosote bush grasshopper *Boottettix argentatus* Bruner (Orthoptera: Acrididae: Gomphocerinae) from The Bolson of Mapimi, Dgo. (Chihuahuan Desert), Mexico.

GROUP	SPECIES	OBSERVATIONS
Aves: Troglodytidae	<i>Campylorhynchus brunneicapillus</i> (Lefresnaye, 1835)	Catch adults and nymphs on foliage, principally during breed season from spring to summer. (*)
	<i>Salpinctes obsoletus</i> (Say, 1823)	Catch principally adults on foliage in spring and early summer.
	<i>Catherpes mexicanus</i> (Swainson, 1829)	Catch adults on foliage in spring and early summer
Aves: Tyrannidae	<i>Sayornis saya</i> (Bonaparte, 1825)	Occasional forager.
	<i>Pyrocephalus rubinus</i> (Boddaert, 1783)	Occasional forager.
	<i>Myarchus cinerascens</i> (Laurence, 1851)	Occasional forager.
Reptiles: Phrynosomatidae	<i>Cophosaurus texanus</i> Troschel 1850	Occasionally catch some females on the ground in late summer.
Reptiles: Teiidae	<i>Cnemidophorus gularis scalaris</i> Cope, 1982	Occasionally catch some females on the ground in late summer
	<i>Cnemidophorus tigris</i> Baiard and Girard 1852	Occasionally catch some females on the ground in late summer
Coleoptera: Carabidae	<i>Pasimachus punctatus</i> Haldeman, 1843	Adult feeds on egg masses, digging in the ground, catch spring early nymphs emerging from the ground and occasionally catch some females in late summer
Coleoptera: Meloidae	<i>Pyrota postica</i> Le Conte, 1866	Larval instars feeds on egg masses under the ground, mainly that located near to the top surface
	<i>Epicauta</i> spp.	Larval instars feeds on egg masses under the ground; adults catch nymphs and adults on foliage during all summer and early autumn.
Diptera: Asilidae	<i>Efferia</i> sp. and other unknown species	Feed on the egg masses near to the top surface, catch nymphs and adults on foliage; very active during all summer and autumn.
Diptera: Bombyliidae	<i>Mythiconia</i> spp.	The eggs are placed near grasshopper oviposition holes, when fly larvae emerge feed on the egg masses in late summer.
Dictyoptera: Mantidae	<i>Stagmomantis limbata</i> (Hann)	All its life could hunt nymphs and adults on foliage or stems of creosote bush during all summer.
Hemiptera: Reduviidae	<i>Zelus socus</i> Ulher	Principally feed on nymphs caught on foliage during summer.
Orthoptera: Tettigonidae Dectecinae	<i>Capnobotes fuliginosus</i> (Thomas, 1872) <i>Eremopedes scuderii</i> Cockerell, 1898	Both species feed on nymphs and adults on foliage during summer.
Orthoptera: Tettigonidae Listrocelinae	<i>Neobarettia spinosa</i> (Caudell, 1907)	Very rare species, was recorded only during two rainy years (1992, 1993) in a high density creosote bush place, feeds on nymphs and adults on foliage in summer.

Appendix 1. continued

GROUP	SPECIES	OBSERVATIONS
Araneae: Araneidae	<i>Araneus diadematus?</i>	These orb weaver spiders catch nymphs and adults in their nets from spring to late summer or autumn.
Araneae: Argiopidae	<i>Argiope aurentia</i> Lucas, 1833	
Araneae: Theraphosidae	<i>Aphonopelma</i> sp.	These nocturnal spiders are the biggest terrestrial hunter arthropod in the region. Search preys on ground in the afternoon.
Diptera: Nemestrinidae	Probably only one species	Internal parasite of adults, all instar stages were located inside at grasshopper thorax level, parasitism between 5 and 8.8% (N=20, N=50), from consecutive summer samples (1992, 1993).
Acari: Trombididae	Probably only one species	External parasite located principally in legs and/or ventral surface of preadults and adults, parasitism between 12 and 35%, average 3 and maximum 8 parasites by adult (N=20, N=80, N=38), samples from consecutive summers (1991, 1992, 1993).

(*)Information reported by:

Garza, H. A. 1988. La teoría del forrajeo central de Orians y Pearson (1979), en *Campylorhynchus bruneicapillus* (Aves: troglodytidae). Tesis Licenciatura. Fac. Ciencias UNAM.

Hermosillo, M. S. 1989. Forrajeo y nidificación en *Campylorhynchus bruneicapillus* (Aves: troglodytidae). Tesis Licenciatura. Fac. Ciencias UNAM.