

Short Communication

Distribution of *Hieroglyphus nigrorepletus* (Bolivar, 1912) (Hemiacridinae: Acrididae: Orthoptera) in Various Provinces of Pakistan

RIFFAT SULTANA¹, M. SAEED WAGAN AND NAHEED SOOMRO

Department of Zoology, University of Sindh, Jamshoro-Pakistan

¹Corresponding author's e-mail: riffatumer@hotmail.com

ABSTRACT

A total of 496 specimens of *H. nigrorepletus* (Bolivar) were collected from various provinces of Pakistan during 2003 - 04. A single female of *H. nigrorepletus* was recorded for the first time from desert area of Sindh.

Key Words: Hemiacridinae: acrididae: orthoptera; Distribution; Brachypterous rice; Grasshopper

INTRODUCTION

The grasshoppers are important component of agriculture fields and grasslands and their global pest status has been reviewed in detail by (Jago, 1998). *Hieroglyphus nigrorepletus* (Bolivar, 1912) cause considerable damage to Rice, maize, sugarcane, wheat and fodder crops. Until now a detailed survey of this Rice pest has not been attempted although several authors have made reference to it (Main, 1912; Kirby, 1914; Uvarov, 1922, 1932 & 1977; Roonwall, 1945 & 1976) (Ahmad, 1975-80; Bhatia *et al.*, 1965), Charan Singh (1972) and Mason (1973). The following study was carried out on the distribution, incidence and important host plants of *H. nigrorepletus*.

MATERIALS AND METHODS

The present survey was conducted in various provinces of Pakistan from July 2003 to December 2004, because during these months maximums population of *H. nigrorepletus* is found in the field. The material was collected from the following districts/localities Thatta Sujawal, Karachi Malir, Nawabshah, Hyderabad, Badin proper, Mirpur Sukkaro, Mirpurkhas, Nagar Parkar (Thar), Umerkot, Shikarpur Ghari yaseen and Golarchii from lower Sindh, Rawalpindi, Chakwal, Lahore and Gujrat from Punjab, Las bala district from Balochistan, where as in the N.W.F.P. Manshera, Abbatabad, Haripur, Shinkari, Battal and Baffa.

Specimens were captured by insect hand net (8" diameter 20" depth) and by hand picking. Then collected material was preserved by conventional methods.

Hieroglyphus nigrorepletus (Bolivar, 1912)

Hieroglyphus furcifer, 1891. Indian Museum Notes, ii: 30.

Hieroglyphus furcifer, Maxwell-Lefory, 1906. Mem. Dep. Agr. India, i: no. 1.

Hieroglyphus furcifer, Maxwell-Lefory, 1906. Ind. Ins. Pests: 120.

Hieroglyphus furcifer, Maxwell-Lefory, 1907. Mem. Dep. Agr. India, i: no. 2: 120.

Hieroglyphus furcifer, Maxwell-Lefory, 1909. Ind. Ins. Life: 87.

Hieroglyphus nigrorepletus Bolivar, 1912. Trab. Mus. Madrid, no. 6: 54-56.

Hieroglyphus nigrorepletus, Coleman, Journ. Bombay N.H. Soc, xxiii: 172-174.

Hieroglyphus nigrorepletus, Fletcher, Some S. Ind. Insects: 531.

Hieroglyphus bettoni Kirby, 1914. Fauna Brit. Ind., Acrid: 202-203.

Hieroglyphus vastator Carl, 1916. Revue Suisse Zool., xxiv, no. 6: 478-481.

Hieroglyphus nigrorepletus, Bolivar, 1918 Rev. R. Acad. Cien. Madrid, xvi, seg. ser: 397.

Hieroglyphus nigrorepletus, Bolivar, 1918. Trab. Mus. Madrid, no. 34: 29.

Hieroglyphus nigrorepletus Uvarov, 1922. Bull. Ent. Res. XIII (2): 235.

Hieroglyphus nigrorepletus Mason, 1973. Bull. Br. Mus. nat. Hist (Ent.) 28(7): 526-531.

Diagnosis. Large and robust. Integument shallow, pitted shiny. Hairy on three distal abdominal sternites. Pronotum with weak median carina dorsum cross by three deep sulci, posterior margin of pronotum obtuse angular. Prosternal process conical slightly curved apically, mesosternal interspace slightly open; metasternal interspace closed. Cercus simple longer than supra-anal plate, slightly incurved, apex oblique, acute.

Coloration. General coloration buff with yellowish buff patches; first, third and fourth sulci of pronotum with broad black bands on sides of pronotum third sulcus joins first laterally, two broad black parallel bands connect all sulci on

dorsum; wing hyaline, veins dark brown or pale buff; hind knee black on inner and outer side, a black patch continues on tibia. Spurs of tibia black, tips of spines black; rest of tibia bluish buff. Brown and green color is more common.

Material Examined

Sindh: Thatta, 28.viii.2003 8♂ 4♀, Nawabshah 14.ix.2003 6♂ 5♀, Hyderabad proper 18.ix.2003. 2♂ 5♀, Badin Proper 26.ix.2003. 10♂ 2♀, Mirpur Sukkaro 17.x.2003. 4♂ 3♀, Nagar Parkar (Thar) 26.ix.2003. 1♀, Shikarpur Ghari Yaseen 12.viii.2004. 10♂ 7♀, Golarchii 07.ix.2004. 7♂ 11♀, Mirpur Sukkaro 18.ix.2004. 8♂ 9♀, Mirpurkhas 23.x.2004. 14♂ 8♀, Badin proper 08.x.2004. 7♂ 4♀, Punjab: Rawalpindi 3.vii.2003. 2♂ 2♀, Chakwal 27.viii.2003. 3♂ 2♀, D.G. Khan 23.x.2003. 2♂ 2♀, Multan 9.x.2003. 1♂ 1♀, Lahore 7.x.2003. 3♂ 1♀, Chakwal 14.viii.2004. 1♂ 6♀, D.G. Khan 2.viii.2004. 3♂ 4♀, Lahore 6.x.2004. 2♂ 2♀, Rawalpindi 17.x.2004. 5♂ 8♀, Multan 23.vii.2004. 16♂ 8♀, N.W.F.P: Abbotabad 15.vii.2003. 14♂ 18♀, Menshera 17.vii.2003. 9♂ 12♀, Battle 21.viii.2003. 19♂ 9♀, Hairpur 23.viii.2003. 21♂ 9♀, Shinkari, 19.viii.2003. 10♂ 19♀, Abbotabad 17.viii.2004. 16♂ 19♀, Menshera proper 21.ix.2004. 23♂ 18♀, Battle 25.x.2005. 16♂ 13♀, Shinkari 23.x.2004. 9♂ 14♀, the same but 28.x.2004. 13♂ 10 ♀, Balochistan: Las bela 16.viii.2003. 6♂ 2♀, the same but 13.x.2004. 5♂ 3♀.

RESULTS AND DISCUSSION

A total of 496 specimen of *H. nigrorepletus* were collected and their distribution at provinces levels is shown in (Table I) this table also shows the incidence. Specimen recorded in fair number from N.W.F.P., because their

Table II. List of important host plants

<i>Echinochloa colonum</i>	Cultivated field
<i>Cynadon dactylon</i>	Common lawn grass
<i>Oryza sativa</i> (L.)	Rice
<i>Zea maize</i>	Common cultivated maize
<i>Andropogon sorghum</i>	Jowar
<i>Penicum tergidum</i>	Grasses
<i>Digitaria sp.</i>	Grasses

diversity and abundance generally depend on the availability of host plants and high rainfall in this region. A single female has been collected for the first time from desert area Nagar Parkar (Thar). Earlier Bhatia *et al.* (1965) and Charan Singh (1972) recorded from the desert part of Rajasthan and Kutch district of Gujrat. We confirmed that this species occurs in desert area. It also seems from (Table I) that total population of hoppers was highest during the summer months (July, August, September & October) and lowest during winter months such as (November & December) etc. The reason is that lower temperature of winter months discouraged the build up of hopper population, while the high temperature and monsoon rain of summer encouraged it. The hopper first fed on the grasses e-g *Penicum tergidum* and *Digitaria sp.* and later entered the cultivated maize and jowar field and finally on the paddy field and cause considerable damage. So from July to October lot of hoppers were observed in the field. (Table II) shows the plants attacked by *H. nigrorepletus*.

Although *H. nigrorepletus* occurs in both macropterous and brachypterous forms but during the present investigation only brachypterous form came in collection. Ghouri and Ahmad (1960) reported small swarm of about 500 species that were fully macropterous form but

Measurement (mm)

	Male (n = 23)			Female (n = 23)		
	(Mean)	(Range)	(S.D)	(Mean)	(Range)	(S.D)
Length of body	33.41	(30.4-48)	05.63	38.26	(38.26)	3.38
Length of antenna	13.37	(8.7-6.1)	05.63	38.26	(31-44)	02.55
Distance b/w eyes	2.23	(1.4-2.4)	0.46	2.95	(1.5-2.5)	1.2
Length of head	04.59	(3.5-5.6)	0.78	1.92	(3.7-5.8)	4.32
Length of pronotum	8.68	(7.37-9.8)	0.74	8.70	(7.3510.15)	0.61
Length of tegmina	10.6	(10.3-10.9)	0.21	11.7	(10.4-11.7)	1.6
Max.width of tegmia	09.2	(05-09)	01.55	1.2	(06-08)	1.56
Length of hind femur	1.95	(10.6-20.4)	04.09	1.92	(11.5-21.6)	1.37
Max.width of hind femur	3.06	(2.1-3.15)	0.55	3.09	(2.3-4.1)	1.03
Length of hind tibia	12.15	(10.5-20.4)	03.5	13.15	(11.2-20.5)	04.2

Table I. Distribution of *H. nigrorepletus* in various provinces of Pakistan (During 2003 - 2004)

	Sindh				Punjab				N.W.F.P				Balochistan				Total			
	2003		2004		2003		2004		2003		2004		2003		2004		2003		2004	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
July	10	07	13	09	08	06	06	09	18	15	12	17	---	---	02	01	36	28	33	36
August	08	05	17	14	04	03	04	03	26	21	31	37	02	---	01	02	40	29	53	56
September	11	06	09	07	03	05	03	06	14	13	10	14	01	02	02	---	29	26	24	27
October	01	02	06	06	02	01	---	08	11	07	06	08	03	---	---	---	14	10	12	22
November	---	---	01	03	---	---	---	02	04	02	05	01	---	---	---	---	09	02	06	04
December	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	30	20	46	39	17	15	13	28	73	58	64	77	06	02	05	03	128	95	128	145

during this study no such swarm was recorded.

Acknowledgement. The authors wish to thank Pakistan Science Foundation for research grants (Project No. PSF S-SU/Bio 338).

REFERENCES

- Ahmad, F.U., 1975–80. *Survey of Grasshoppers in Arid and Semi-arid Regions of Pakistan*. PI.480.No.PK-ARM-20(FG_Pa-212).500
- Bhatia, D.R., Charan Singh and P.J.S. Ahluwalia, 1965. Incidence of *Hieroglyphus nigrorepletus* Bol. (Orthoptera, Acrididae) in the desert parts of Rajasthan and Kutch district of Gujarat. *Indian J. Ent.*, 26: 464–5
- Charan Singh, 1972 Further incidence of *Hieroglyphus nigrorepletus* Bol. (Orthoptera: Acrididae) in the desert parts of Gujarat. *Plant Protection Bulletin, India*, 22: 38
- Ghouri, A.S.K. and H. Ahmad, 1960. Swarming of *Hieroglyphus nigrorepletus*. *PL. Prot. Bull. F.A.O.*, 8: 135–6
- Kirby, W.F., 1914. *The fauna of British India Including Ceylon and Burma*. P: 276. (Orthoptera: Acrididae). France and Taylor, London
- Main, T.F., 1912. A series of campaigns rice grasshoppers *Hieroglyphus banian* F.Agric. *J. India*. 1: 246–56
- Mason, J.B., 1973. A revision of the genera *Hieroglyphus* Krauss, *Parahieroglyphus* Carl and *Hieroglyphus* Uvarov (Orthoptera: Acridoidea) *Bull. Br. Mus. nat. Hist. (Ent)*, 28: 507–60
- Roonwall, M.L., 1945. Notes on the Bionomics of *Hieroglyphus nigrorepletus* (Orthoptera: Acrididae) at Bananas, United Province, India. *Ent. Res.*, 36: 339–41
- Roonwall, M.L., 1976. Ecology and biology of the grasshoppers *Hieroglyphus nigrorepletus* Bolivar (Orthoptera: Acrididae). *Z. Angew. Zool. Berlin*, 63: 171–85
- Uvarov, B.P., 1922. Rice grasshoppers of the genus *Hieroglyphus* and their nearest allies. *Bull. ent. Res.*, 13: 225–41
- Uvarov, B.P., 1932. Studies in the Iranian Orthoptera II. Some new or less known Acrididae. *Trudy Zool. Inst. Leningr*, 1: 187–233
- Uvarov, B.P., 1977. Grasshoppers and Locust: hand behaviour Ecology, biogeography and population dynamics. *Centre for Overseas Res. London*, 2: 613

(Received 01 June 2006; Accepted 20 August 2006)