



New Record of Six-spot Ground Beetle *Anthia (Anthia) sexguttata sexguttata* (Fabricius, 1775) (Coleoptera : Carabidae) from Jehanabad, Bihar (India), with its Systematic Account, Distribution and Beneficial Role

Akhlaq Husain^{1*} and Wajid Hasan²

¹Zoological Survey of India, former Scientist-E,

41, Hari Vihar, Vijay Park, Chakrata Road, Dehra Dun (Uttarakhand), India.

²Krishi Vigyan Kendra, Jehanabad-804 408, BAU, Sabour (Bihar), India.

(Corresponding author: Akhlaq Husain*)

(Received: 20 February 2023; Revised: 01 March 2023; Accepted: 09 March 2023; Published: 20 April 2023)

(Published by Research Trend)

ABSTRACT: The present communication deals with the new record of *Anthia (Anthia) sexguttata sexguttata*, the Six-spot Ground Beetle, belonging to family Carabidae under order Coleoptera, from Jehanabad, Bihar (India). Its adults and larvae feed on agriculture pests mainly on soil which also sometimes ascend to vegetation around in search of their preferred food and hence is considered a beneficial predator, playing a major role in biological control of insect pests. In view of this a detailed account with systematic account, altitudinal range, distribution, habitat, food & feeding, life cycle, beneficial role and self-defence, is provided here.

Keywords: New record, *Anthia (Anthia) sexguttata sexguttata*, Jehanabad, Bihar.

INTRODUCTION

Anthia sexguttata, the Six-spot Ground Beetle, is the only species under the genus *Anthia* Weber, 1801 in India, belonging to the beetle family Carabidae.

The carabid beetles of India and their related aspects has attracted the attention of various workers during the past (Fischer, 1806; Andrews, 1929; Mathur and Khattar 1958; Misra, 1975; Saha, 1986; Kumar and Rajagopal 1996; Satpathi, 2000; Kazmi and Ramamurthy, 2004; Robert and Ramaraju 2006; Roychoudhury and Kushwaha, 2011; Hackel and Farkac, 2013; Rahman *et al.*, 2013; Hegde *et al.*, 2014; Kushwaha and Hedge 2015; Kushwaha *et al.*, 2015; Imam *et al.*, 2016; Thakkar and Parikh 2016; Deshmukh and Gajbhiye, 2017; Chandra *et al.*, 2018; Gupta *et al.*, 2018; Singhal *et al.*, 2018; Saman and Goswami, 2019; Gurule *et al.*, 2020; Ghosh *et al.*, 2021; Singh *et al.*, 2021; Akhil *et al.*, 2022; Meena and Kumari, 2022 and some websites) but no published record from Bihar is available. However a record from Muzaffarpur in a website (indiabiodiversity.org/observation/show/14894266) is there.

Saha *et al.* (1992), Saha (1995), Biswas *et al.* (1997), Saha and Halder (2000), Mukhopadhyay and Sharma (2008), Kushwaha and Hedge (2017), Kushwaha *et al.* (2017); Sruthi and Sabu (2022) studied the carabids of Kolkata (Calcutta), West Bengal, Delhi, Meghalaya, Pin Valley National Park (Lahaul & Spiti district, Himachal Pradesh), Dudhwa National Park (Uttar Pradesh), Sundarban Biosphere Reserve and Chinnar Wildlife Sanctuary (southern Western

Ghats) respectively but didn't record *Anthia (Anthia) sexguttata sexguttata*, an Indian form, from there.

Recently a good specimen was sighted and photographed from Jehanabad in Bihar (Husain and Hasan 2021: Abst.), details of which are submitted here in the form of full paper.

SYSTEMATIC ACCOUNT, DISTRIBUTION AND OTHER ASPECTS:

Anthia (Anthia) sexguttata sexguttata (Fabricius, 1775)

Synonymy:

Carabus sexguttata Fabricius, 1775. *Syst. Ent.*, 236 (type-locality: Surat Indiae = Surat, Gujarat, India).

Carabusthunbergi Fischer, 1806. *Memoires de la Societe des Naturalistes de l'Universite Imperiale de Moscou*, 1: 18 (type-locality India, vide Hackel and Farkac, 2013).

Pachymorpha orientalis Hope, 1838. *Col. Man*, 2: 163, pl. 3, fig. 4 (type-locality: circa Poonah in India orientali) (Himalayas, Jhelum Valley, Poona, Bangalore); Chaudoir, 1861. *Bull. De la soc. Imp. Des nat. Mosc.*, 1: 563; Motchulsky, 1864. *Bull. De la soc. Imp. Des nat. Mosc.*, 2: 216.

Anthia indica Chaudoir, 1861. *Bull. De la soc. Imp. Des nat. Mosc.*, 1: 562 (type-locality: Indesorientalis).

Anthia elliptica Motchulsky, 1864. *Bull. De la soc. Imp. Des nat. Mosc.*, 2: 216 (type-locality: Tranquebar).

Anthia sexguttata, Andrewes (1929). *The Fauna of British India, including Ceylon and Burma*. Coleoptera, Carabidae, Vol. I.- Carabinae: 24, 41; Andrewes, 1930.

Cat. Ind. Ins., Part 18- Carabidae: 31; Gardner, J. C. M., 1939. *Proceedings of the Royal Entomological*

Society of London, B 8(2):18-20; Mathur and Khattar, 1958. *Suppl.Proc. Indian Academy of Sciences*, B 50: 1-25, text fig. 1-7; Misra, 1975. *Indian Forester*, 101 (10): pp. 605; Kumar and Rajagopal, 1996. *Karnataka J. Agric. Sci.*, 9 (4): 613; Satpathi, C. R., 2000. *Insect Environment*, 6 (1): 16 pp.; Kazmi and Ramamurthy, V. V., 2004. *Zoos' Print Journal*, 19 (4): 1447; Robert and Ramaraju, 2006. *International Journal of Acarology*, 32:2, 153-161; Roychoudhury and Kushwaha, 2011. *Vaniki Sandesh*, (1): 8; Rahman *et al.*, 2013. *Trends in Biosciences*, 6 (1): 78-79; Hedge *et al.*, 2014. *Insecta: Coleoptera: Family Carabidae*: 169, 176. In: Hedge, V. D. and Venkataraman, K. (eds.). *Faunal inventory of Uttar Pradesh*; Kushwaha and Hedge, 2015. *Insecta: Coleoptera: Carabidae*. In: *Fauna of Uttar Pradesh. State Fauna Series*, 22 (Part-2):397, 405; Kushwaha *et al.*, 2015. *Zoos' Print Journal*, 30 (1): 21, pl. 4; Imam *et al.*, 2016. *Journal of Entomology and Zoology Studies*, 4 (1): 476, 477; Thakkar and Parikh, 2016. *Journal of Entomology and Zoology Studies*, 4 (5): 1084, fig. Deshmukh and Gajbhiye, 2017. *International Digital Library of Technology and Research*, 1: 1-18, pl. 2, fig. Chandra *et al.*, 2018. Chapter 9. *Insecta: Coleoptera (Beetles)*: 226, 238-239. In: Chandra and Boaz, *Faunal diversity of Bastar district, Chhattisgarh*; Singhal *et al.* (2018). *The Journal of Basic and Applied Zoology*, 79 (1): page 5; Gurule *et al.*, 2020. *Bioinfolet*, 17 (3 A): 368, pl. 1, fig. 1. Agrawal, 2021. *Practical manual classification of insects*: 19; Ghosh *et al.*, 2021. *Current status of faunal diversity of Telangana*: 223; Husain and Hasan, 2021. *3rd International Conference on Global Initiative in Agricultural, Forestry and Applied Sciences for Food Security, Environmental Safety and Sustainable Development (GIAFAS-2021)*, 17-18 October, 2021, Souvenir cum Abstracts/Proceeding Book, Vol. 1, Abstract No. 300: 184; Singh *et al.*, 2021. *International Journal for Research in Applied Sciences and Biotechnology*, 8 (3): 153; Akhil *et al.*, 2022. *Journal of Threatened Taxa*, 14 (12), 2226- 22269; Meena and Kumari, 2022. *Agricultural Science Digest- A Research Journal of Agriculture, Animal and Veterinary Sciences*, Volume/Issue 0: 5, fig. 3. *Anthia sexguttata sexguttata*, Hackeland Farkac, 2013. *Studies and Reports, Taxonomical Series*, 9 (2): 272; Muntha *et al.*, 2019. *Journal of Entomology and Zoology Studies*, 7(5): 699-701. *Anthia (Anthia) sexguttata*, Khatri *et al.*, 2016. *Pak. J. Entomol.*, 31 (2): 220-221, fig. 1a. *Anthia (Anthia) sexguttatasexguttata*, Gupta *et al.*, 2018. *Insecta: Coleoptera*: 441, fig. E. In: Chandra *et al.*, *Faunal diversity of Indian Himalaya*.

Common Name: Six-spot Ground Beetle.

Sighted and Photographed: 1 example; Gandhar, Jehanabad, Bihar; 26.viii.2021; by 2nd author (WH).

Classification: Class Insecta Linnaeus, 1758, subclass Pterygota Lang, 1888, infraclass NeopteraMartynov, 1923, superorder Endopterygota Sharp, 1898, Order Coleoptera Linnaeus, 1758, suborder Adephaga Schellenberg, 1806, family CarabidaeLatreille, 1802; subfamily Anthiinae Bonelli, 1813, tribe Anthiini

Bonelli, 1813, subtribe Anthiina; genus *Anthia* Weber, 1801; subgenus *Anthia* Weber, 1801.

Diagnostic Features:

Head capsule and Mouth parts:Mathur and Khattar (1958) provided a detailed account on morphology of head capsule and mouth parts with following noteworthy features:

Epicranial stem absent, epicranial arm lie in an invagination (a compound structure representing epistomal suture and entire frons), which form anterior and posterior boundary of vertex and clypeus respectively; vertex much increased in extent and a clypofrons formed; antennae kataceratous; occiput and occipital sutures well developed; cephalic end of post-clypeus infolded, carrying pre-clypeus on ventral side, clypealis attached to both pre- and post-clypeus; epipharynx lying in a membranous depression strengthened by a semicircular ridge; number of incisors and molars in both mandibles same but arrangement different, a scrobe present on dorsal surface of each mandible; maxilla without a dististipes; prognathous mouthparts comprise large maxillae, mandibles and labium forming an efficient seizing organ; hypopharynx feebly developed and adnate to posterior wall of labium; tentorium weak and non-chitinous.

Prothorax cordiform/heart-shaped, distinctly expanded laterally and with large lateral flanges (Khatri *et al.*, 2016).

Mandibles large; pronotum broad towards head, constricted and narrowed at base; elytra large, oval or sub-rounded (Chandra *et al.*, 2018).

Colouration: Body black with yellow or white setae and pubescence, six relatively large white spots on dorsum (four over elytra and two on thorax).

Size:4-5 cm, male very slightly smaller than female (Khatri *et al.*, 2016); 4 cm approximately(en.wikipedia.org; dictionary.sensagent.com).

Sexual Dimorphism: Mandibles and prothorax sexually dimorphic as mandibles elongate in male, shorter in female; base of pronotum with two posterior flanges or flattened extensions in male, tumescent without extensions in female; male very slightly smaller than female (Khatri *et al.*, 2016)

Larva: Flattened form with large head capsule and prominent mandibles (Gardner, 1939).

Altitudinal Range: 1,581 ft at Ajmer (Mathur and Khattar 1958); 312-368 m at Jhunjhunu district (Meena and Kumari 2022).

Distribution:

India:

Bihar: Muzaffarpur district (indiabiodiversity.org/observation/show/14894266) (old record); Jehanabad district (new record).

Rest of India: Andhra Pradesh, Assam, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Kerala, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, New Delhi, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal (Hackel

and Farkac 2013) and India (as *Carabusthunbergi* Fischer, 1806, a synonym).

Indian authors: Assam (Joysagar tank, Rahman *et al.*, 2013);, Chhattisgarh (Bastar district- Donbha, Jagdalpur, K.N.V.P., Chandra *et al.*, 2018; Balamdehi, Handi and Barnawapara, Raipur district, Kushwaha *et al.*, 2015); Gujarat (Thakkar and Parikh 2016; Vadodra, Singhal *et al.*, 2018; Surat, Akhil, *et al.*, 2022; Sayan, indiabiodiversity.org/group/malfrogs/observation/show/17158535); Karnataka (Kumar and Rajagopal 1996; DoresaniPalaya Forest, Bengaluru, Akhil *et al.*, 2022,

indiabiodiversity.org/group/beetles_of_india/observation/show/1731671); Madhya Pradesh (Jabalpur, Roychoudhury and Kushwaha, 2011); Maharashtra (Pench Tiger Reserve (East), Deshmukh and Gajbhiye 2017; Nashik city, Gurule *et al.*, 2020; Pune, Akhi; *et al.*, 2022; Thane,

[commons.wikimedia.org/wiki/File:Six_Spot_Ground_Beetle_Anthia_sexguttata_by_Dr._Raju_Kasambe_DSC_N9917_\(10\)](https://commons.wikimedia.org/wiki/File:Six_Spot_Ground_Beetle_Anthia_sexguttata_by_Dr._Raju_Kasambe_DSC_N9917_(10))); North-west Himalaya, Western Himalaya and Central Himalaya (Gupta *et al.*, 2018); Puducherry (Akhil *et al.*, 2022), Rajasthan (Chittorgarh, en.wikipedia.org; Ajmer, Mathur and Khatta 1958; Jodhpur, Akhil *et al.*, 2022; Jhunjhunu district, Meena and Kumari 2022), southern India (Robert and Ramaraju., 2006; en.wikipedia.org) and Tamil Nadu (Topslip, Misra, 1975; Kalayarkovil, Edaikazhinadu (Gangathakuppam), Kattupakkam, Nemili, Kunnathu pond (Villupuram district.), Vedanthangal, Karkodai (Theni district), Vedur Reservoir (Tindivanam, Villupuram district), Palavakal, Thiruvannamalai, Mudumalai, Pachaimalai hills, Manchavadi, Tharangambadi, Akhil *et al.*, 2022; The ethipalayamroad,

indiabiodiversity.org/observation/show/324225); Telangana (Ghosh *et al.*, 2021); South India (Robert and Ramaraju 2006; guatemala.inaturalist.org), Uttar Pradesh (Uttar Pradesh, Hedge *et al.*, 2014; Panchopiran, Sultanpur, Kushwaha and Hedge 2015; Parvati Aranga Bird Sabctuary, District Gonda, Singh *et al.*, 2021) and West Bengal (Sacred groves of Purulia district, Imam *et al.*, 2016).

Elsewhere: Bangladesh, Nepal, Pakistan (Khatri *et al.*, 2016; Muntha *et al.*, 2019; Akhil *et al.*, 2022) and Sri Lanka (Hackel and Farkac 2013); South Asia (drier parts, dictionary.sensagent.com; en.wikipedia.org; guatemala.inaturalist.org).

Habitat: Scrub forests, both in plains and hilly tracts.

Food and Feeding: Predacious and feed on other small insects including grasshoppers and snails (Mathur and Khattar, 1958; dictionary.sensagent.com); carnivorous and could nip smaller children's fingers (Khatri *et al.*, 2016).

Life Cycle: Unusual life cycle as the young larvae enter ants' nests and feed on them, assuming their scent and get accepted as members of the colony (commons.wikimedia.org).

Self-defence Mechanism: In general, *Anthia* spp. are able to spray a jet of formic acid, an irritating acrid fluid, from their anus on their predators to disable them and hence popularly called as oogenpisser i.e. eye-

squirter (Scholtz and Holm 1985; dictionary.sensagent.com; commons.wikimedia.org).

Beneficial Role:

As it feeds on larvae of *Eutectona machaeralis* (syn. *Pyrausta machaeralis*), the Teak Skeletonizer Moth (Crambidae) and *Hyblaea puera*, the Teak Defoliator Moth (Hyblaeidae) can help in controlling their population to some extent (Misra, 1975). It also preys on *Spilosoma obliqua* (syns. *Diacrisia obliqua* and *Spilarctia obliqua*), the Jute Hairy Caterpillar (Erebidae) (Satpathi, 2000).

Spilosoma obliqua being polyphagous feeds on various plants including cereals, fibre crops (jute, ramie, roselle and sunn hemp), mulberry, oilseeds, pulses, vegetables, turmeric and non-cultivated plants and weeds (Sivakumar *et al.*, 2020) and hence *A. sexguttata* is of great help in controlling this caterpillar.

Additionally these moths and other pests can also be controlled by spraying *Neem* Seed Kernel Extract 5% and Quinalphos pesticide @ 2 ml/lit on infested plants (agritech.tnau.ac.in/forestry).

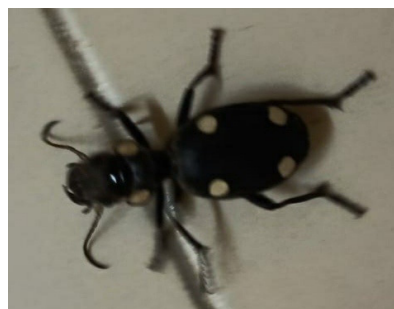


Fig. 1. Six-spot Ground Beetle.



Fig. 2. Six-spot Ground Beetle.

Other subspecies with distribution:

Anthia (Anthia) sexguttata afghana Anichtchenko, 2009 (type-locality: Oruzgan, Sahrestan, 2400 m, 2500 m; Ghazni, Karmay SW Moqur= Central Afghanistan; Pakistan) (as *Anthia (Anthia) mannerheim afghan* Anichtchenko, 2009).

Anthia (Anthia) sexguttata mannerheimi Chaudoir, 1842. *Bull. De la soc. Imp. Des nat. Mosc.*, 2: 810 (type-locality: Prov. De Mazenderan, pres de Astrabad= Iran).

Acknowledgement. Authors are thankful to Dr. S. S. Talmale, Scientist-C, Western Regional Centre, Zoological Survey of India, Ravet Road, Pune (Maharashtra) for help in some literature.

Conflict of Interest. None.

REFERENCES

- Akhil, S. V., Thomas, K. S. and Kumar, S. (2022). Desert Carabidae (Insecta: Coleoptera) of India. *Journal of Threatened Taxa*, 14(12), 2226- 22269.
- Andrewes, H. E. (1929). The Fauna of British India, including Ceylon and Burma. Coleoptera, Carabidae, Vol. I.- Carabinae. Taylor and Francis, London: v-xviii +431. pls. I-IX (24, 41 (Anthiini) (India-throughout the plains, but not found either in Burma or Ceylon).
- Bauer, T. and Kredler, M. (1993). Morphology of the compound eyes as an indicator of life-style in carabid beetles. *Canadian Journal of Zoology*, 71, 799-810.
- Biswas, S., Mukhopadhyaya, P., Saha, S. K., Basu, C. R., Chatterjee, S. K., Chakraborty, S. K., Biswas, D. N., Halder, S. K., Ghosh, S. K. and Chakraborty, P. (1997). Coleoptera. In: Fauna of Delhi. *State Fauna Series*, 6, 325-353.
- Chandra, K., Shrivastava, O. P., Hegde, V. D., Kushwaha, R. K., Ghosh, S., Sar, A., Dawn, P., Halder, S. and Majumder, A. (2018). Chapter 9. Insecta: Coleoptera (Beetles): 225-226, 238-239. In: Chandra, K. and Boaz, A. A., *Faunal diversity of Bastar District, Chhattisgarh*: 1-706 (Published by State Forest Research and Training Institute, Forest Department, Chhattisgarh & Zoological Survey of India).
- Deshmukh, C. K. and Gajbhiye, S. H. (2017). Base line data of diversity of family Carabidae in Pench Tiger Reserve (East), Maharashtra, India. *International Digital Library of Technology and Research*, 1, 1-18.
- Fischer, G. (1806). Nouvelles espèces d'insectes de la Russie. *Memoires de la Societe des Naturalistes de l'Universite Imperiale de Moscou*, 1, 12-22.
- Gardner, J. C. M. (1939). The larva of *Anthia sexguttata* (Fab.) (Coleoptera :Carabidae). *Proceedings of the Royal Entomological Society of London*, B 8(2), 18-20.
- Ghosh, J., Dutta, S., Gupta, D. and Chandra, K. (2021). Chapter 33. Insecta: Coleoptera (Terrestrial): 221-226. In: Chandra, K., Deepa, J., Raghunathan, C., Jadhav, S. S. and Karuthapandi, M., 2021. *Current status of faunal diversity of Telangana*: 1-394. Zoological Survey of India Publication.
- Gupta, D., Chandra, K., Das, P. and Ghosh, J. (2018). Insecta: Coleoptera: 399-590. In: Chandra et al. *Faunal diversity of Indian Himalaya*. Zoological Survey of India Publication.
- Gurule, S. A., Vivek, S. and Kajal, P. S. (2020). Diversity of beetles (Insecta: Coleoptera) from Nashik City, Maharashtra. *Bioinfolet*, 17(3 A), 366-371.
- Hackel, M. and Farkac, J. (2013). A checklist of the subfamily Athiiniinae Bonelli, 1813 of the World (Coleoptera: Carabidae). *Studies and Reports, Taxonomical Series*, 9(2), 261-366.
- Hedge, V. D., Kushwaha, R. K., Lal. B., Sar, A., Chakraborty, S., Ghosh, S. K., Mukhopadhyay, P., Chatterjee, S. K. and Srivastava, O. P. (2014). Insecta: Coleoptera: Family Carabidae: 168-192 (169, 176) In: Hedge, V. D. and Venkataraman, K. (eds.). *Faunal inventory of Uttar Pradesh*. Zoological Survey of India Publication.
- Husain, A. and Hasan, W. (2021). New record of Ground Beetle *Anthia sexguttata* (Fabricius, 1775) (Coleoptera: Carabidae), biological pest controller, from Jehanabad, Bihar (India). 3rd *International Conference on Global Initiative in Agricultural, Forestry and Applied Sciences for Food Security, Environmental Safety and Sustainable Development (GIAFAS-2021)*, 17-18 October, 2021 at Dehra Dun. Souvenir cum Abstracts/Proceeding Book, Vol. 1, Abstract No. 300: 184.
- Imam, I., Mazumdar, A., Mallick, K., Mitra, S. and Das, P. (2016). Diversity of ground insect fauna in the sacred groves of Purulia district, West Bengal. *Journal of Entomology and Zoology Studies*, 4(1), 474-478.
- Kazmi, S. I. and Ramamurthy, V. V. (2004). Coleoptera (Insecta) fauna from the Indian Thar Desert, Rajasthan. *Zoos' Print Journal*, 19 (4), 1447-1448.
- Khatri, I., Baloch, N., Rustamani, M. A., Panhwar, W. A., Sultana, R. and Lakho, G. M. (2016). Ground beetle fauna (Carabidae) of Merkan division, Balochistan. *Pak. J. Entomol.*, 31(2), 219-225.
- Kumar, P. and Rajagopal, D. (1996). Carabid beetles (Coleoptera: Carabidae) of Karnataka with their prey and ecological notes. *Karnataka J. Agric. Sci.*, 9(4), 610-615.
- Kushwaha, R. K. and Hedge, V. D. (2015). Insecta: Coleoptera: Carabidae. In: Fauna of Uttar Pradesh. *State Fauna Series*, 22(Part-2), 395-426.
- Kushwaha, R. K. and Hedge, V. D. (2017). Ground beetles: From Dudhwa National Park, Uttar Pradesh, India. Bugs R All#158. In: *Zoos' Print Journal*, 32(7), 09-17.
- Kushwaha, R. K., Hedge, V. D. and Chandra, K. (2015). Ground beetles (Coleoptera: Carabidae) from Chhattisgarh, India. *Zoos' Print Journal*, 30(1), 20-23.
- Kushwaha, R. K., Chakraborti, U., Roy, S., Biswas, O. and Mitra, B. (2017). Diversity of ground beetles (Insecta: Coleoptera: Carabidae) from Indian Sundarban with seven new records. *Bioscience Discovery*, 8(3), 335-339.
- Mathur, P. N. and Khattar, N. (1958). Morphology of the head capsule and mouth parts of *Anthia sexguttata* Ho. (Coleoptera, Adephaga, Carabidae, Harpalinae, Anthiini). *Suppl.Proc. Indian Academy of Sciences*, B 50, 1-25.
- Meena, R. and Kumari, V. (2022). Diversity, abundance and composition of ground beetles (Coleoptera: Carabidae) in Jhunjhunu district of Rajasthan, India. *Agricultural Science Digest- A Research Journal of Agriculture, Animal and Veterinary Sciences*, Volume/Issue 0, 1-7.
- Misra, R. M. (1975). Note on *Anthia sexguttata* Fabricius (Carabidae: Coleoptera), a new predator of *Pyraustamachaeralis* Walker and *Hyblaepuera* Cramer. *Indian Forester*, 101(10), 605.
- Mukhopadhyay, P. and Sharma, R. M. (2008). Insecta: Coleoptera. In: Fauna of Pin Valley National Park. *Conservation Area Series*, 34, 85-88.
- Muntha, S. T., Baloch, N., Sultana, R., Soomro, I. A., Kalhor, A. S. and Ali, S. (2019). Biodiversity of beetles (Coleoptera) from district Mirpurkhas and its adjoining areas, Sind, Pakistan. *Journal of Entomology and Zoology Studies*, 7(5), 699-701.
- Rahman, I., Sonowal, C. and Nath, M. (2013). Diversity pattern of beetles (Insecta: Coleoptera) in and around the historic Joysagar tank of Assam, India. *Trends in Biosciences*, 6(1), 78-79.
- Robert, W. H. and Ramaraju, K. (2006). A new species of *Regenpolipus* (Acari: Podapolipidae) from *Anthia sexguttata* (Coleoptera: Carabidae) from Southern India and a pictorial key to genera of world

- Podapolipidae from carabidae. *International Journal of Acarology*, 32, 2, 153-161.
- Roychoudhury, N. and Kushwaha, D. K. (2011). Predators of Teak pests, *Hyblaea puera* Cramer and *Eutectonamachaeralis* (Walker). *Vaniki Sandesh*, State Forest Research Institute, Jabalpur, 1(1), 7-14.
- Saha, S. K. (1986). Ground beetles (Insecta: Coleoptera: Carabidae) of Silent Valley (Kerala, India). *Rec. zool. Surv. India*, 84(1-4), 67-77.
- Saha, S. K. (1995). Insecta: Coleoptera: Adephaga: Carabidae: Harpalini. In: Fauna of West Bengal. *State Fauna Series*, 3, 53-75.
- Saha, S. K. and Halder, S. K. (2000). Insecta: Coleoptera: Adephaga: Carabidae. In: Fauna of Meghalaya. *State Fauna Series*, 4(1), 1-40.
- Saha, S. K., Mukherjee, A. K. and Sengupta, T. (1992). Carabidae (Coleoptera: Insecta) of Calcutta. *Rec. zool. Surv. India*, Occ. Paper No. 144, 1-63.
- Saman, A. and Goswami, T. N. (2019). Soil surface dwelling insects and spiders in Katarni rice nursery at Sabour, Bihar. *Indian Journal of Entomology*, 81(4), 694-696.
- Satpathi, C. R. (2000). Preys of the carabid beetle *Anthia sexguttata* and tiger beetle, *Cicindela sp.* *Insect Environment*, 6(1), 16 pp.
- Scholtz, C. H. and Holm, E. (1985). Insects of southern Africa: 195 pp. Butterworths.
- Singh, B. Tripathi, S. and Devi, J. (2021). Diversity assessment of major insect orders in Parvati Aranga Bird Sanctuary, District Gonda, Uttar Pradesh, India. *International Journal for Research in Applied Sciences and Biotechnology*, 8(3), 150-159.
- Singhal, S., Thakkar, B., Pandya, P. and Parikh, P. (2018). Unraveling the diversity, phylogent, and ecological role of cryptic coleopteran species of Vadodra district: a first comparative approach from India. *The Journal of Basic and Applied Zoology*, 79(1), 53-67, 14 pp (page no. 5).
- Sivakumar, G., Kannan, M., Babu, V. R., Mohan, M., Kumari, S., Rangeshwaran, R., Venkatesan, T. and Ballal, C. R. (2020). Characterization and field evaluation of tetrahedral and triangular nucleopolyhedrovirus of *Spilosoma obliqua* (SpobNPV) strain NBAIR1 against jute hairy caterpillar. *Egyptian Journal of Biological Pest Control*, 30(82).
- Sruthi, M. C. and Sabu, T. K. (2022). Checklist of Carabidae (Coleoptera) in the Chinnar Wildlife Sanctuary, a dry forest in the rain shadow region of the southern Western Ghats, India. *Journal of Threatened Taxa*, 14(8), 21619-21641.
- Thakkar, B. and Parikh, P. H. (2016). A study on diversity and abundance of coleopterans in Gujarat. *Journal of Entomology and Zoology Studies*, 4(5), 1082-1089.

Websites:

- https://agritech.tnau.ac.in/forestry/forest_pest_Teak%20defoliator.html (pest)
- [https://commons.wikimedia.org/wiki/File:Six_Spot_Ground_Beetle_Anthia_sexguttata_by_Dr._Raju_Kasambe_DSCN9917_\(10\).jpg](https://commons.wikimedia.org/wiki/File:Six_Spot_Ground_Beetle_Anthia_sexguttata_by_Dr._Raju_Kasambe_DSCN9917_(10).jpg) (Thane, Maharashtra)
- [https://commons.wikimedia.org/wiki/File:Six-spot_ground_beetle_\(25125412591\).jpg](https://commons.wikimedia.org/wiki/File:Six-spot_ground_beetle_(25125412591).jpg) (life cycle)
- [http://dictionary.sensagent.com/Anthia%20sexguttata/en-en/\(size,distribution,food,defence\)](http://dictionary.sensagent.com/Anthia%20sexguttata/en-en/(size,distribution,food,defence))
- [https://en.wikipedia.org/wiki/Anthia_sexguttata\(size; South Asia; figure\)](https://en.wikipedia.org/wiki/Anthia_sexguttata(size;South%20Asia;figure))
- [https://guatemala.inaturalist.org/taxa/349056-Anthia-sexguttata \(South Asia; southern India\)](https://guatemala.inaturalist.org/taxa/349056-Anthia-sexguttata(South%20Asia;southern%20India))
- <https://indiabiodiversity.org/observation/show/324225> (Tamil Nadu)
- https://indiabiodiversity.org/group/beetles_of_india/observation/show/1731671 (Bengaluru)
- <https://indiabiodiversity.org/observation/show/14894266> (Muzaffarpur, Bihar)
- <https://indiabiodiversity.org/group/malfrogs/observation/show/17158535> (Sayan, Gujarat)

How to cite this article: Akhlaq Husain and Wajid Hasan (2023). New Record of Six-spot Ground Beetle *Anthia (Anthia) sexguttata sexguttata* (Fabricius, 1775) (Coleoptera: Carabidae) from Jehanabad, Bihar (India), with its Systematic Account, Distribution and Beneficial Role. *Biological Forum – An International Journal*, 15(4): 358-362.