

On the distribution of *Vagrans egista* (Cramer, 1780) in West Bengal, India

Sobre la distribución de *Vagrans egista* (Cramer, 1780) en el sur de Bengala occidental, India

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Abstract. *Vagrans egista* (Cramer, 1780) is reported for the first time from southern part of West Bengal, India. The Raygar forest of Bankura district in the plateau region is the second locality for the reported species in West Bengal, which extends the distribution range (aerial distance: 525 km) of the species from its known locality, Buxa Tiger Reserve of Alipurdwar district in the state. This paper also reports occurrence of *Rapala pheretima* and *Gerosis bhagava* in Bankura district for the first time. Importance of an invasive plant, *Mikania micrantha* has also been discussed as a nectaring plant of butterflies.

Key words: Butterfly; Deccan; invasive plant; nectaring; new record.

Resumen. *Vagrans egista* (Cramer, 1780) es registrada por primera vez en la parte sur de Bengala occidental, India. El bosque de Raygar del distrito de Bankura en la región de la meseta es la segunda localidad reportada en Bengala occidental, lo que extiende el rango de distribución (distancia aérea: 525 km) de la especie desde su localidad conocida, la Reserva de Tigres de Buxa del distrito de Alipurduar en el estado. Esta nota también informa por primera vez la presencia de *Rapala pheretima* y *Gerosis bhagava* en el distrito de Bankura. Se discute la importancia de la planta invasora *Mikania micrantha* como proveedora de néctar para mariposas.

Palabras clave: Deccan; mariposa; néctar; nuevo registro; planta invasora.

India is a megadiverse country in term of ecological diversity comprising of ten biogeographic zones: Trans Himalaya Himalaya, Desert, Semi-arid, Western Ghats, Deccan Plateau, Gangetic Plain, Northeast, Islands and Coasts (Rodgers *et al.* 2002) as well as floral and faunal diversity. West Bengal is a state in Eastern India which spans through parts of four biogeographic zones (Himalaya, Gangetic Plain, Deccan Plateau and Coasts) and is a home to a rich array of biodiversity. Among these biogeographic zones of West Bengal, there is further scope for exploration in the plateau region. The present study site (Fig. 1) is Raygar forest near Sutan (22°50'02.7" N 86°43'19.0" E; altitude: 214 m) at Ranibandh block in undulating south-western part of Bankura district of Medinipur division. The area is covered with a dense dry deciduous forest (Mukherjee and Mondal 2020), primarily dominated by some common trees as *Shorea robusta* Roth., *Diospyros melanoxylon* Roxb., *Madhuca longijolia* (J.Konig) J.F.Macbr., *Deinocalamus strictus* (Roxb.) Nees, *Butea monosperma*

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(Lam) Taub , *Bo ibax leiba* L. *Phoenix sylvestris* (L) Roxb , *Ficus* spp. of deciduous forest, which is bisected by a rain-fed seasonal stream. The region is characterized by hard beds of primary laterite formed by in situ weathering of Gneissic rocks (Sen *et al.* 2020) and the ferruginous laterite crust overlain with latosol is rich in sandy loam (Ghosh and Guchhait 2015). Such typical lateritic type soil of Rarh region holds the last remnants of dry deciduous forests (Ghosh 2008). This part of Bankura district is connected with Chhotanagpur Plateau (the north-easternmost extension of Deccan Plateau) in the West and the lower gangetic plains in the East. This rolling upland is an eroded remnant of the Chhotanagpur Plateau. Tropical dry sub-humid climatic conditions prevail in the study area, which is classified as Zone Aw according to Köppen-Geiger climatic classification (Peel *et al.* 2007). The average temperature is 25.7 °C: May and January represent the hottest (41 °C) and coolest (6 °C) months respectively, and the average annual rainfall is 1455 mm: July and January are the wettest (505.7 mm) and driest months (7.2 mm) respectively (Anonymous 2021).



Figure 1. Study site from Bankura district, West Bengal, India (Source: Google Earth maps). / Sitio de estudio: en el distrito de Bankura Bengala Occidental, India (Fuente: mapas de Google Earth).

Butterflies are good indicators of ecosystem health due to their sensitivity to ecological parameters (New 1991; Bonebrake *et al.* 2010). They are one of the most important pollinators and herbivores in nature (Kunte 2000). The abundance of terrestrial insects including butterflies are declining by 8.81% in each decade, even more in the unprotected areas (van Klink *et al.* 2020). Hence, the study on the butterflies is significant to maintain ecological balance. The authors are carrying extensive field surveys throughout heterogeneous patches of Bankura district since 2015 as part of a long-term study on the butterfly diversity of plateau region. During this study, an individual of *Vagrans egista* (Cramer, 1780) has been observed to nectaring on *Mikania micrantha* Kunth flower-heads and the butterfly has also been photographed. The butterfly was identified comparing the captured photographs with standard literatures (Evans 1932; Kehimkar 2016).

Observation. An individual of *Vagrans egista* has been observed to nectaring on flower of *Mikania micrantha* at about 01:26 PM (GMT: +5:30) on 15.ii.2020 (Figs. 2-3). Two of the authors (SD and AS) captured the photographs of the butterfly and identified the species comparing the photos with aforementioned literatures. It is a distinctive species with its golden tawny upper side with its narrow dark brown outer edge (Kehimkar 2016) and the underside has pale purple shimmering with a series of small glowing white spots (Cramer 1780). Besides, *Phalanta phalantha* (Drury, 1773) were also observed to nectaring on *Mikania micrantha* flowers in association with *Vagrans egista*. In addition, *Rapala pheretima* (Hewitson, 1863) and *Gerosis bhagava* (Moore, 1865) (Figs. 4-5) are also reported first time from the Bankura district. Therefore, 25 more species has been observed nectaring on the flowers of *Mikania micrantha* (Table 1).



Figures 2-5. Butterflies nectaring on *Mikania micrantha*. 2-3. *Vagrans egista*, Raygar forest, India. 4-5. *Rapala pheretima* and *Gerosis bhagava* newly recorded species for Bankura district. / 2-3. *Vagrans egista* libando nectar sobre *Mikania micrantha*, bosque de Raygar, India. / 4-5. *Rapala pheretima* y *Gerosis bhagava*, nuevos registros de especies para el distrito de Bankura.

Table 1. Systematic list of observed nectaring Lepidoptera on flowers of *Mikania micrantha*. / Lista sistematizada de los lepidópteros nectarizantes observados en flores de *Mikania micrantha*.

Sl. No.	Species	No. of Individuals
Family Scythrididae		
1	<i>Eretmocera impactella</i> Walker, 1864	5
Family Hesperidae		
2	<i>Ampittia dioscorides</i> (Fabricius, 1793)	1
3	<i>Gersia bhagava</i> (Moore, 1866)	1
4	<i>Pelopidas mathias</i> (Fabricius, 1798)	1
5	<i>Parnara bada</i> (Moore, 1878)	1
Family Pieridae		
5	<i>Catopsilia pyranthe</i> (Linnaeus, 1758)	6
6	<i>Delias eucharis</i> (Drury, 1773)	3
7	<i>Eurema blanda</i> (Boisduval, 1836)	1
8	<i>Eurema hecabe</i> (Linnaeus, 1758)	2
Family Lycaenidae		
9	<i>Spindasis ictis</i> (Hewitson, 1865)	1
10	<i>Spindasis vulcanus</i> (Fabricius, 1775)	6
11	<i>Amblypodia anita</i> Hewitson, 1862	4
12	<i>Tajuria cippus</i> (Fabricius, 1798)	1
13	<i>Rapala manea</i> (Hewitson, 1863)	3
14	<i>Rapala pheretima</i> (Hewitson, 1863)	6
15	<i>Rapala varuna</i> (Horsfield, 1829)	3
16	<i>Anthene emolus</i> (Godart, 1824)	2
Family Nymphalidae		
17	<i>Euploea core</i> (Cramer, 1780)	5
18	<i>Junonia almana</i> (Linnaeus, 1758)	6
19	<i>Junonia altites</i> (Linnaeus, 1763)	3
20	<i>Junonia iphita</i> (Cramer, 1779)	2
21	<i>Tanaecia lepidea</i> (Butler, 1868)	85
22	<i>Athyma perius</i> (Linnaeus, 1758)	2
23	<i>Neptis jumbah</i> Moore, 1858	2
24	<i>Pantoporia hordonia</i> (Stoll, 1790)	4
25	<i>Phalanta phalantha</i> (Drury, 1773)	12
26	<i>Vagrans egista</i> (Cramer, 1780)	1
Family Noctuidae		
27	<i>Episteme adalatrix</i> (Kollar, 1844)	1
Family Erebididae		
28	<i>Mangina argus</i> (Kollar, 1844)	1

Before this report, *Vagrans egista* were reported only from Buxa Tiger Reserve (BTR) of Alipurduar district in West Bengal (Sinha *et al.* 2019). Hence, this record is the first report from southern part of the state and second locality report from West Bengal. The present locality is around 500 km (aerial distance) away from previously reported nearby locality at BTR of Alipurduar district in north-eastern part of West Bengal. Moreover, the species is distributed from Uttarakhand to Northeast India and West Bengal, Odisha, Jharkhand, Himachal Pradesh, Andhra Pradesh and Chhattisgarh in India (van Gasse 2013; Varshney and Smetacek 2015; Kehinkar 2016; Kirti *et al.* 2016; Payra *et al.* 2016; Sisodia and Naidu 2019; Gokhale 2021). Globally, *Vagrans egista* is distributed in Nepal, India, Bangladesh, south China to South-east Asia, *i.e.*, Myanmar, Thailand, Laos, Cambodia, Vietnam, Philippines and parts of Indonesia and Malaysia (Kehinkar 2016; Inayoshi 2021). This observation fills the missing sampling gap of the species from the plateau part of West Bengal. Since this is not known to be a migratory species, a resident population of the species can be assumed in this region. Besides, literature search reveal that report of *Rapala pheretima* and *Gerosis bhagava* are the first records from Bankura district (Nayak 2020; Mukherjee and Mondal 2020).

The *Mikania micrantha* were also observed as notably significant plant for butterfly fauna during the study. This is an extremely fast-growing climber native to Central and South America (Wirjahar 1976). It is now distributed worldwide and is considered as one of the world's most notorious invaders (Holm *et al.* 1977), introduced in Indian subcontinent by the British in 1940s to camouflage airfields during World War II (Tripathi *et al.* 2011) and as ground cover in tea plantations (Prabu *et al.* 2014). Flowering season of the plant in eastern and north-east India is from October to late November and these annual plants die in December and January (Swamy and Ramakrishnan 1987). This plant is known to cause disastrous ecological effects as it kills nearby plant species by reducing light beneath its canopy (Huang *et al.* 2000). However, while many species suffer from the invasion of a species, some of them also benefit from it (Davis *et al.* 2018). Likely, *Mikania micrantha* is an especially important nectaring plant for the flower-visiting insects such as butterflies, moths, hoverflies, bees, and wasps (Hong *et al.* 2011). Thus, this climber enhances the abundance and diversity of insects during the period of its bloom. To control growth of such invasive but beneficiary plant to the insects, biological control might be adopted during blooming season rather than use of herbicide and forest fire. For instance, use of *Ipomoea batatas* (L.) or *Cuscuta campestris* Yunck might be attempted for biological control of *Mikania micrantha* (Shen *et al.* 2015; Li *et al.* 2012). Monoculture of exotic species during afforestation should be avoided, which is responsible for decline of diversity and abundance of flower-visiting insects including butterflies (Nagulapalli *et al.* 2020). However, further extensive study should be attempted to protect butterflies as well as their host and nectaring plants of the plateau region of West Bengal.

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