



New records of pyraloid moths (Lepidoptera: Pyraloidea: Crambidae) from India

Новые находки огнёвкообразных бабочек (Lepidoptera: Pyraloidea: Crambidae) из Индии

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Abstract. Four species of the family Crambidae (superfamily Pyraloidea) are reported for the first time from India, based on the material collected from the Andaman and Nicobar Islands in 2018–2020, namely *Glyphodes cosmarcha* Meyrick, 1887, *Palpita cirralis* (Swinhoe, 1897), *Pachynoa xanthochyta* (Turner, 1933) and *Pagyda arbiter* (Butler, 1879). The diagnoses and the distributional data on these species are provided; the male and female genital structures are illustrated. The female of *G. cosmarcha* and the male and female genitalia of *P. cirralis* are described for the first time.

Резюме. Четыре вида из семейства Crambidae (надсемейство Pyraloidea) впервые приводятся для Индии по сборам 2018–2020 гг. с Андаманских и Никобарских островов: *Glyphodes cosmarcha* Мейрикс, 1887, *Palpita cirralis* (Свинхое, 1897), *Pachynoa xanthochyta* (Турнер, 1933) и *Pagyda arbiter* (Батлер, 1879). Приведены диагнозы и данные по распространению этих видов, а также иллюстрации гениталий самцов и самок. Впервые описана самка *G. cosmarcha*, а также гениталии самца и самки *P. cirralis*.

Key words: India, Andaman and Nicobar Islands, diagnostic characters, Pyraloidea, Crambidae, Spilomelinae, Pyraustinae, new records

Ключевые слова: Индия, Андаманские и Никобарские острова, диагностические признаки, Pyraloidea, Crambidae, Spilomelinae, Pyraustinae, новые находки

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Introduction

The Pyraloidea are ditrysian moths characterised by the basally scaled proboscis, well-developed maxillary palpi, the abdomen with paired tympanal chambers on the second sternite each

with a tympanum and a conjunctiva, the veins R_3 and R_4 of the forewing stalked or fused, and $Sc+R_1$ and R_s of the hind wing anastomosed distal of the discal cell (Munroe & Solis, 1998; Solis, 2007). It is the third largest superfamily of the Lepidoptera, following the Noctuoidea and

Geometroidea, and it is comprised of two families, Pyralidae and Crambidae.

Crambidae is the larger family with just under 10 000 described species worldwide (Solis, 2007). The members of this family have an open tympanal case that is with a wide anteromedial aperture, the conjunctiva and tympanum situated in different planes and meeting at a distinct angle, and developed praecinctorium (Minet, 1981; Maes, 1995). Larvae of pyraloid moths cause major damage to crops worldwide (Clausen, 1978). Species of several subfamilies feed on living plants either internally or externally as leaf rollers, leaf webbers, leaf miners, borers in roots, and seed feeders and can defoliate shrubs and forest, shade and fruit trees (Munroe & Solis, 1998; Nuss et al., 2003–2021). Therefore, new records, distributional limits and range extensions in this group with high economic impact are of high and increasing importance (Singh & Singh, 2013).

The Andaman and Nicobar Islands are true oceanic islands situated in the Bay of Bengal in the northern Indian Ocean between 6° to 14°N and 93° to 94°E. The northern tip of the Andaman Archipelago is about 190 km from Myanmar and the southern tip of the Nicobar Archipelago is only 50 km off the coast of Sumatra, Indonesia. This proximity of the two island groups to different subregions of the Oriental region has a profound effect on the biota with Indo-Burmese and Indo-Malayan affinities in the Andaman and the Nicobar Islands, respectively (Mohanraj & Veenakumari, 2011). The present communication deals with the first report from India of four crambid species collected on the Andaman and Nicobar Islands.

Material and methods

Adult moths were collected on vertical light screens illuminated by two 160-watt mercury lamps for about five hours after sunset, with a Honda EP1000 portable generator used as a power supply. The collected specimens were killed with the help of ethyl acetate vapours in killing jars. After subsequent relaxation, specimens were spread, pinned and labelled following Robinson (1994). Photos of moths were taken with a Nikon P900 digital camera. Dissection of the male and

female genitalia was carried out following Robinson (1976) with appropriate modifications; their descriptive terminology follows Klots (1970). The images of the genitalia were taken using a digital camera attached to a CZM6 stereomicroscope. The specimens are deposited in the National Zoological Collections of the Andaman & Nicobar Regional Centre, Zoological Survey of India (Haddo, Port Blair).

Taxonomic account

Order **Lepidoptera**

Superfamily **Pyraloidea**

Family **Crambidae**

Subfamily **Spilomelinae**

Glyphodes cosmarcha Meyrick, 1887
(Figs 1A, 2A, 2D)

Material examined. **India, Andaman and Nicobar Islands:** *North Andaman I.*, 1 female, Diglipur, Bahadur Tikrey Vill., 13°22.751'N, 92°57.585'E, 50 m, 8.I.2019, B.S.K. Rao leg. (reg. no. ZSI/ANRC/T/11618); *Great Nicobar I.*, Great Nicobar Biosphere Reserve: 2 females, birdwatching point, 6°59.948'N 93°52.773'E, 136 m, 15.XI.2018, K.C. Gopi et al. leg. (reg. nos. ZSI/ANRC/T/11619, 11620); 1 male, watch tower, 7°01.053'N 93°55.383'E, 123 m, 8.XI.2018, K.C. Gopi et al. leg. (reg. no. ZSI/ANRC/T/12722).

Redescription. Wing span 42–44 mm. Head and antennae whitish ochreous. Labial palpi with an obscure dark fuscous lateral line, light ochreous dorsal to it, white ventrally. Thorax and abdomen pale ochreous, with indistinct whitish lines.

Forewings elongate triangular, semitransparent; ground colour pale greyish ochreous. Costa slightly sinuate, its basal area light ochreous. Antemedial band light greyish, bordered with faint black lines. Medial area with semitransparent subrectangular fascia merging at one-third of anal margin. Postmedial area with a semitransparent subquadrate blotch at basal three-fifths and with a dark fuscous obscure spot posterior to this blotch, merging with anal margin. Postmedial area distally with a narrow light fuscous line forming a small spot on costa, sinuate posterior to it, in posterior half forming four small connected triangular spots. Terminal area broad, dark fuscous. Cilia pale ochreous, with obscure fuscous terminal line.

Hind wings whitish, semitransparent. Transverse vein with oblique yellow-ochreous streak bordered with dark fuscous. A small dark fuscous apical spot present; two small roundish dark fuscous spots present near hind margin posterior to apex; a line near posterior margin dark fuscous; cilia white, with obscure grey line.

Legs pale ochreous; hind tibiae with outer spurs one-third as long as inner ones.

Male genitalia. Uncus with long narrow neck and spatulate apex with fine hairs and with setae on apical three-fourths. Tegumen broadly rounded. Tergite inverted Y-shaped, with posterior portion forming two adjacent, parallel rods. Transtilla well-sclerotised, with medial ventral notch extending downward. Juxta short and narrowly cone-shaped, rod-like medial processes with tips curved ventrally at base. Vinculum sclerotised, long, W-shaped, with a narrow triangular sclerotised ventral extension. Valva long, gradually narrowed basally and pointed at apex; costa slightly curved inwards medially, ventral margin slightly curved and pointed medioventrally. Harp thorn-shaped, slightly curved. Saccus thick, narrowed to apex, three-fourths of length of valva; saccus triangular. Coremata forming complex basal structure, with long dense hairs. Phallus short, straight, with a pair of pointed thorn-shaped cornuti.

Female genitalia. Papillae anales elliptical, with fine hairs. Anterior apophyses thinner and longer than posterior ones. Antrum sclerotised. Ductus bursae thickened from middle to distal three-fourths. Corpus bursae weakly kidney-shaped, with two elongate ovate signa.

Distribution. Australia (from Cape York in Queensland to northern New South Wales), Indonesia (Sulawesi, Nusa Barong Island), New Guinea, Thailand (Common, 1990; Sutrisno, 2007). First record for India (Great Nicobar and North Andaman Islands).

Remarks. The genus *Glyphodes* Guenée, 1854 contains about 120 described species throughout the World, with 25 species recorded from South-East Asia (Robinson et al., 1994).

Palpita cirralis (Swinhoe, 1897)
(Figs 1B, 2B, 2E)

Material examined. **India**, Andaman and Nicobar Islands: *Great Nicobar I.*: 2 males, 1 female, near Laxmi

Nagar Vill., 6°55.561'N 93°53.973'E, 31 m, 11.XI.2018, K.C. Gopi et al. leg. (reg. nos. ZSI/ANRC T-7498, T-7499, T-7500); 1 female, 1 male, Gobind Nagar, 7°00.326'N 93°53.343'E, 10 m, 5.XI.2018, B.S.K. Rao leg. (reg. nos. ZSI/ANRC/T/7791, 7792); 1 male, 2 females, Galathea Wildlife Sanctuary, 6°49.389'N 93°52.072'E, 45 m, 18.XII.2019, B.S.K. Rao leg. (reg. nos. ZSI/ANRC/T/10561, 11637, 11054); 1 female, Great Nicobar Biosphere Reserve, birdwatching point, 6°59.948'N 93°52.773'E, 136 m, 15.XI.2018, K.C. Gopi et al. leg. (reg. no. ZSI/ANRC/T/11053); *North Andaman I.*, 1 male, Diglipur, Bahadur Tikrey Vill., 13°22.751'N 92°57.585'E, 123 m, 8.I.2019, B.S.K. Rao leg.; *Swaraj Dweep I.*, 2 females, Kalapathar Basti-II, 11°57.424'N 93°00.999'E, 7 m, 11.XI.2019, B.S.K. Rao leg. (reg. no. ZSI/ANRC/T/ T-7501, 12459).

Redescription. Wing span 25–26 mm. Coloration silvery white. Frons flat, silvery; vertex rounded. Labial palpi upturned, basal segment with shades of grey, tip brownish black with silvery scales. Ocelli present, situated posterior to scapus, surrounded with white and ochreous scales. Scapus carved at base. Antenna filiform, almost reaching postmedial line of forewing. Thorax and patagia white.

Forewing slightly sinuous, with tuft of scales at base, golden brown costa, brown patches at subcosta and at middle of cell followed by blackish discocellular, and more distally brown patches beyond end of the cell. Apex acute.

Hind wing white, with a discocellular spot and rounded apex. Both wings with light fuscous marks at submarginal line and with whitish cilia. Ventral side of wings whitish.

Femur greyish white. Tibia brownish grey, outer spur of hind tibia dark brown, one-third as long as inner spur.

Abdomen whitish, in males with black anal tuft.

Male genitalia. Uncus short, broad and robust, with strongly widened spatulate apex, dorsally covered with stouter spines. Valva with bluntly pointed apex. Vinculum strongly sclerotised. Saccus triangular. Harp pointed. Juxta short. Aedeagus very long, with two filiform cornuti.

Female genitalia. Papillae anales elliptical, densely covered with fine hairs. Anterior apophyses long, posterior apophyses short. Antrum strongly sclerotised, U-shaped. Ductus bursae short. Corpus bursae globular, without signa.

Distribution. Borneo (Brunei, Sabah, southern Borneo), Indonesia and West Malaysia including

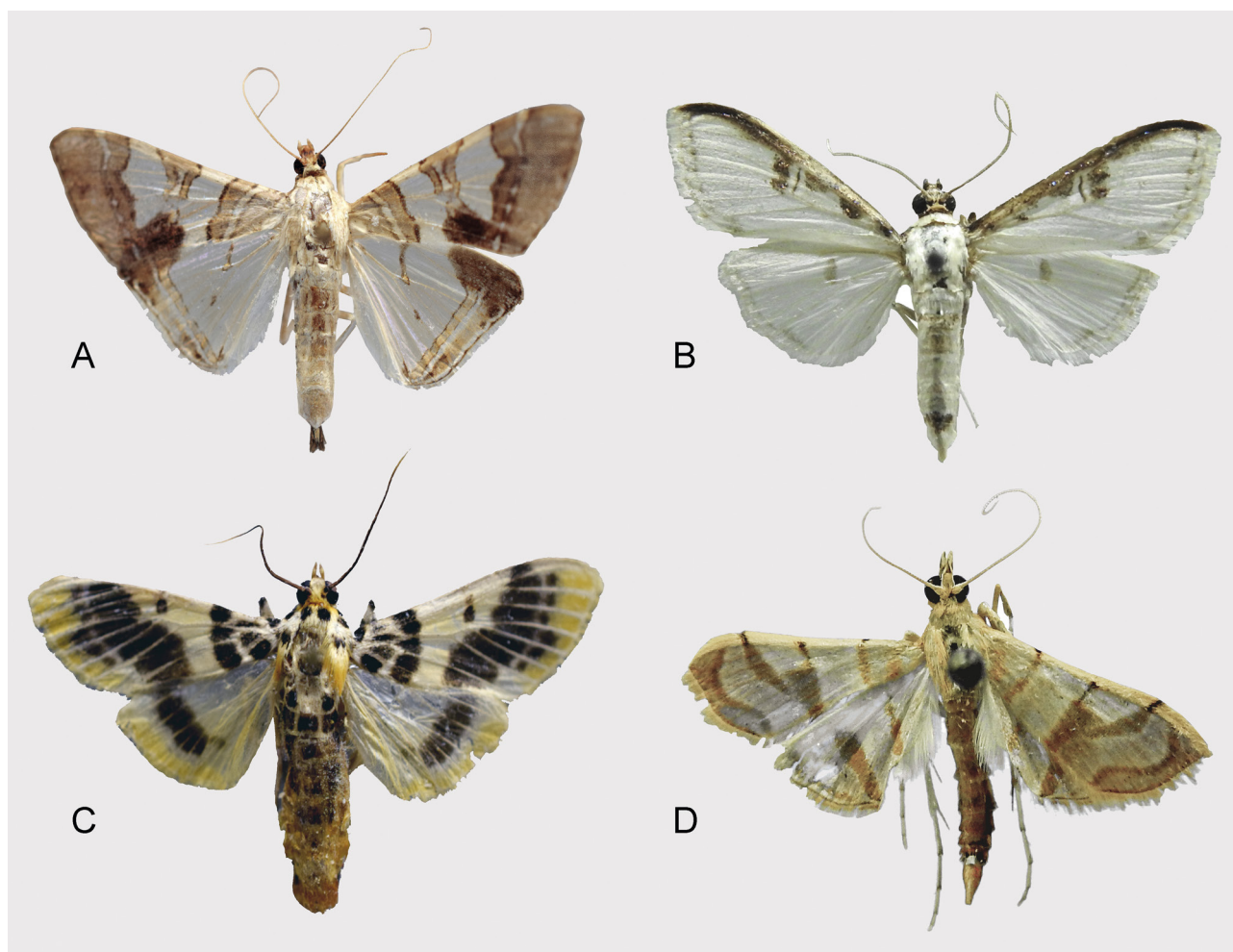


Fig. 1. Crambidae. Adults, general view. **A**, *Glyphodes cosmarcha* Meyrick, 1887; **B**, *Palpita cirralis* (Swinhoe, 1897); **C**, *Pachynoa xanthochyta* (Turner, 1933); **D**, *Pagyda arbiter* (Butler, 1879).

Singapore (Swinhoe, 1897; Hampson, 1899; Whitaker et al., 2014). First record for India (Andaman and Nicobar Islands).

Pachynoa xanthochyta (Turner, 1933)
(Figs 1C, 2F)

Material examined. **India, Andaman and Nicobar Islands:** *South Andaman I.*, 1 female, Bambooflat, tsunami shelter, 11°42.596'N 92°42.573'E, 95 m, 2.VI.2019, Dilmani Kumari leg. (reg. no. ZSI/ANRC/T/12734); *Great Nicobar I.*, 1 female, Great Nicobar Biosphere Reserve, watch tower, 6°59.931'N 93°52.892'E, 123 m, 8.XI.2018, K.C. Gopi et al. leg. (reg. no. ZSI/ANRC/T/12737).

Redescription. Wing span 45–50 mm. Frons and vertex with yellow scales. Labial palpi light ochreous, upturned. Antennae fuscous. Patagia

and tegula yellow with four and two black rounded spots, respectively. Thorax with two fuscous anterior dots.

Forewings narrow, elongate-triangular, with light yellow ground colour. Black wide subbasal stripes lying distal to basal costal spot. Series of black antemedial patches present. Discocellular patch black, roughly rectangular. Medial area light yellow, without patches. Series of slightly oblique black postmedial patches present. Six black rectangular subterminal patches present. Terminal area with yellow scales, broad at apex.

Hind wing yellow, with a series of black postmedial spots forming a broad stripe. Terminal area yellow.

Legs pale ochreous; anterior pair mostly dark fuscous.

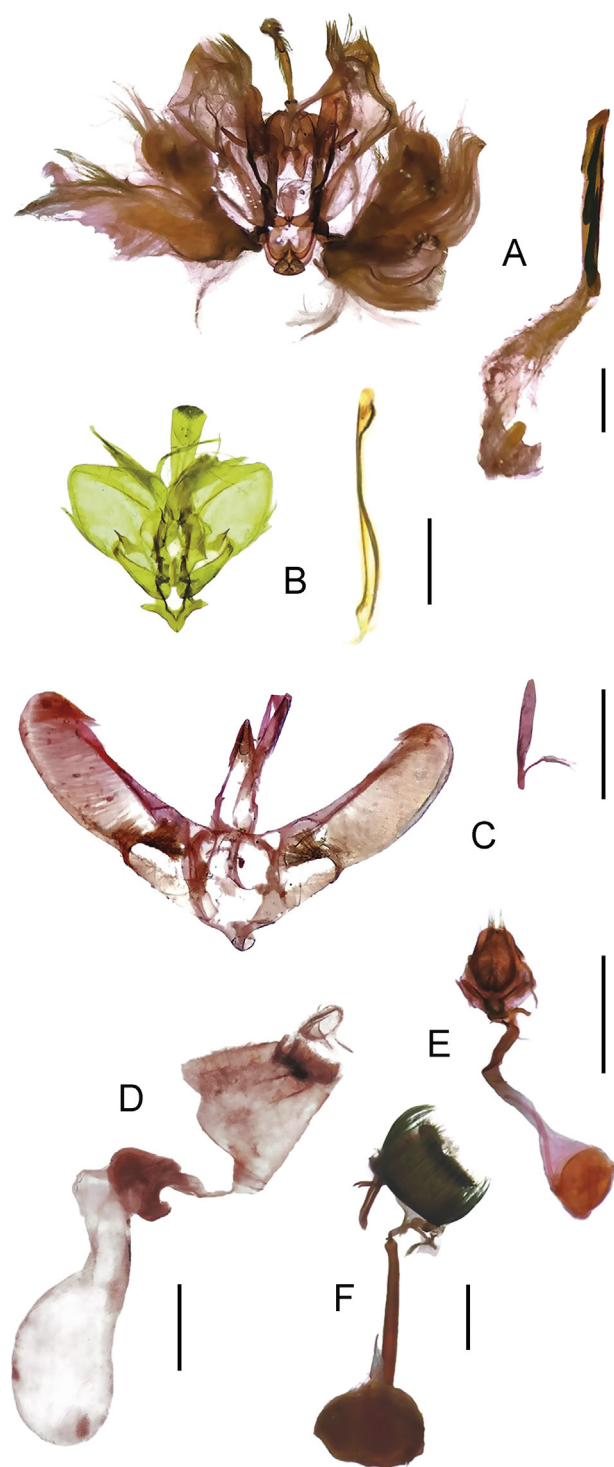


Fig. 2. Crambidae. Male genitalia (A–C), female genitalia (D–F). **A, D,** *Glyphodes cosmarcha* Meyrick, 1887; **B, E,** *Palpita cirralis* (Swinhoe, 1897); **C,** *Pagyda arbiter* (Butler, 1879); **F,** *Pachynoa xanthochyta* (Turner, 1933). Scale bars: 1 mm (A–C), 2 mm (E–F).

Abdomen ochreous-yellow, dorsally with black patches on each segment, whitish near anal angle. Cilia yellowish.

Female genitalia. Papillae anales thick, densely covered with robust hairs. Anterior apophyses nearly as long as posterior apophyses; posterior apophyses with pointed tip. Antrum simple, narrow. Ductus bursae short, straight, without folds. Corpus bursae membranous, oval, without signum.

Distribution. Australia (Queensland), Bhutan (Irungbam et al., 2016), Laos (Ko, 2018). First record for India (Andaman and Nicobar Islands).

Remarks. The genus *Pachynoa* Lederer, 1863 comprises 14 described species, which are mostly distributed from India and Taiwan to the Solomon Islands (Robinson et al., 1994; Nuss et al., 2013–2021). Five species of *Pachynoa* were recorded from India, namely *P. fuscilalis* Hampson, 1891, *P. grossalis* (Guenée, 1854), *P. hypsalis* Hampson, 1896, *P. mineusalis* (Walker, 1859), and *P. thoosalis* (Walker, 1859) (Ko et al., 2018).

Subfamily Pyraustinae

Pagyda arbiter (Butler, 1879)

(Figs 1D, 2C)

Material examined. **India, Andaman and Nicobar Islands, North Andaman I.,** 2 males, Diglipur, Tal Tikrey Vill., 13°13.141'N 92°51.658'E, 5 m, 10.III.2019, B.S.K. Rao leg. (reg. no. ZSI SI/ANRC/T/9903).

Redescription. Wing span 18–22 mm. Frons and vertex yellowish fuscous, latter with white lateral stripe bordered with black scales anteriorly. Maxillary palpi well-developed, basally with dark greyish scales. Labial palpi obliquely upturned, with long scales on ventral surface of second segment; marginal scales marked with dark grey; basal segment whitish ventrally; apical segment nearly parallel to vertex. Antenna filiform; scape with white stripe on lateroventral surface. Patagia, collar, thorax and abdomen yellowish brown.

Forewings elongate-triangular, with pale ochreous-yellow background; basal area with light yellow patches. Costa light brown, slightly sinuate. Antemedial, medial and postmedial lines ochreous, joined to costa with three stout black patches; medial and postmedial lines connected with each other posteriorly. Subterminal line

slightly curved outwards, connecting subcostal and posterior margin near anal angle, in shape of a weak sickle. Terminal line light brown. Cilia yellowish brown.

Hind wings having a distinct antemedial, medial and postmedial bands. Medial band broad. Postmedial band running parallel to outer margin.

Legs light fuscous-brown; fore tibia banded with white and fuscous-brown; inner spur of hind tibia one-third as long as its outer spur.

Male genitalia. Uncus subtriangular, with distally crowded setae. Valva with editum bearing pinnate setae. Sella horn-shaped, without distal spinules. Transtilla slender. Gnathos weakly pointed. Vinculum U-shaped. Saccus triangular, with blunt tip. Phallus short, with cornutus.

Distribution. China and Japan (Qi & Li, 2019). First record from India (Andaman and Nicobar Islands).

Remarks. We collected this species from near by a secondary forest with understory foliage.

Botys arbiter Butler, 1879 was described from Japan, Yokohama. Hampson (1896) transferred this species to the genus *Pagyda* Walker, 1859. At present, this genus comprises 35 described species with ten species from India, namely *P. amphisalis* (Walker, 1859), *P. argyritis* Hampson, 1899, *P. auroralis* (Moore, 1888), *P. botydaleis* (Snellen, 1880), *P. discolor* Swinhoe, 1894, *P. exalbalis* Hampson, 1896, *P. lustralis* Snellen, 1890, *P. pulverulenta* Swinhoe, 1901, *P. salvialis* Walker, 1859, and *P. straminealis* Hampson, 1896 (Hampson, 1896; Mathew, 2006; Nuss et al., 2003–2021).

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