

# Occurrence of the viable population of *Chasmina candida* (Walker, 1865) (Lepidoptera: Noctuidae: Bagisarinae) on Praslin Island, Seychelles

Ivan N. Bolotov\*, Vitaly M. Spitsin, Yulia S. Kolosova & Artem A. Frolov

Institute of Ecological Problems of the North,  
Ural Branch of the Russian Academy of Sciences, Northern Dvina Emb., 23,  
163000 Arkhangelsk, RUSSIAN FEDERATION

\*corresponding author: [inepras@mail.ru](mailto:inepras@mail.ru)

## Introduction

The “large white” group of noctuids, belonging to the genus *Chasmina* Walker, 1856, includes at least fifteen virtually pure white species that are difficult to separate (Holloway 1989; Barnett *et al.* 1999). *Chasmina candida* (Walker, 1865) is a moderately rare species that is widely distributed in the Indo-Australian tropics to the east of Fiji, including many islands of the Indian Ocean and Pacific (Robinson 1974; Holloway 1989; Barnett *et al.* 1999). The northernmost species records are known from southern Japan (Kishida 2006). Usually, this species is observed in coastal areas, therefore, a recently published record from the mainland India may be erroneous (Gurule & Nikam 2013).

Only *Hibiscus tiliaceus* L. and *Thespecia populnea* (L.) Sol. ex Corrêa (Malvaceae) are listed as valuable host plants for *C. candida* larvae (Gerlach & Matyot 2006; Leong 2010; Robinson *et al.* 2010). Both of these plant species are inhabitants of coastal ecosystems of mainland and oceanic islands, including beach crests and mangroves. Some authors noted that *C. candida* is associated with mangroves (Veenakumari & Prashanth 2009; Leong 2010). But, on the Fiji islands, the species is found in areas of secondary vegetation (Robinson 1974). Leong (2010) provided a description of the last instar larva and data on the species biology in Singapore.

The species is rare in all known localities, and from each locality only a few specimens were recorded (Holloway 1989; Veenakumari & Prashanth 2009; Leong 2010; Sivaperuman & Shah 2012). On oceanic islands, *C. candida* is most widespread in the Fiji archipelago, where it was found on the two major islands, Viti Levu and Vanua Levu, and on four smaller islands (Robinson 1974). In the Seychelles islands, a few specimens were collected from Praslin and Mahé islands, but they were not recorded there since 1960 (Gerlach & Matyot 2006). On Praslin Island, *C. candida* was known from a single record in 1905. The conservation status of the species in the Seychelles was not exactly determined, due to deficiency of reliable data (Gerlach & Matyot 2006).

## Material and methods

This note is based on the field observations effected in January 2013 at Anse Possession, Praslin Island. During evening and night time periods, we recorded the moth

specimens that were attracted to the light of electric lamps of hotels and local houses located in the coastal lowland area. A few specimens of *C. candida* were selectively collected for morphological study. The materials (eight pinned specimens) are deposited in the Biological Museum of the Institute of Ecological Problems of the North of the Ural Branch of the Russian Academy of Sciences, Arkhangelsk city, Russia (INEP). Images of the specimens were recorded with a digital camera Canon EOS 60D. The dissection of the genitalia and male coremata was performed using standard methods for Lepidoptera. The abdomen was macerated in hot 10% KOH solution for 30 min. Then, genitalia and coremata were placed on the temporary slides with glycerin-ethanol solution, and photographed using the stereomicroscope Leica M165C. All images were processed with Adobe Photoshop CS version 8.0.

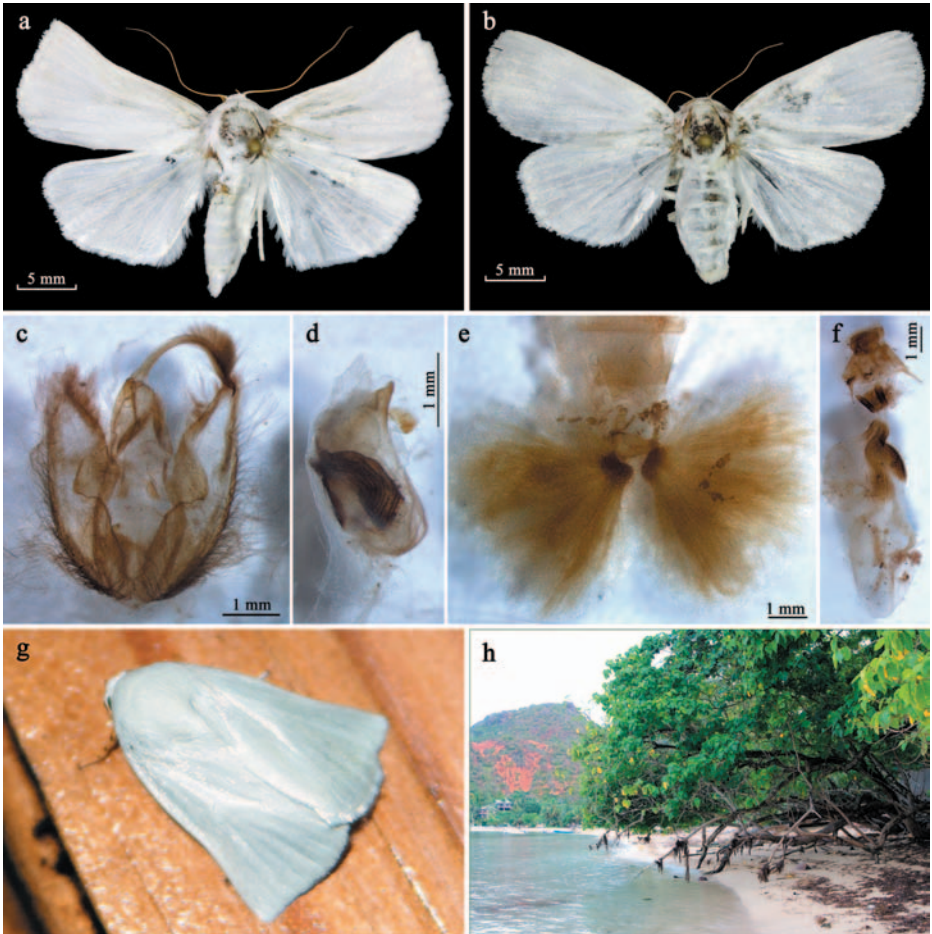
## Results

**Specimens collected.** 5♂, 1♀, Seychelles: Praslin Island, Anse Possession [4°18'36"S; 55°43'45"E], alt. 5 m a.s.l., coastal lowland, at light, 5<sup>th</sup>–8<sup>th</sup> January 2013, I.N. Bolotov leg.; 1♂, 1♀, Seychelles: same locality, at light, 17<sup>th</sup> January 2013, I.N. Bolotov leg.

**Imago habitus.** The male forewing length is 14–16 mm (n = 6); it has a square appearance and the costa concave (Fig. 1a), which are the most distinctive features of the male morphology (Holloway 1989). The apex of the male forewing is square and acute. The female forewing length is 16–17 mm (n = 2); the forewing apex is rounded (Fig. 1b). Both sexes have a pure white marking on head, thorax, abdomen, legs, fore- and hindwings, except for the orange (“ochraceous” by the protologue of Walker (1865)) fore femora, tibiae and tarsi, with black dots on the anterior face of tibia and tarsus. Antennae are brownish or dark-yellow; palpi are white with orange tips. The external characters of the Praslin Island individuals are identical to the specimens collected from Borneo (Holloway 1989) and Singapore (Leong 2010), but differ slightly from the Fijian male specimen (Robinson 1974: Fig. 28), which has a more rounded apex of the forewing.

**Genitalia.** The male genitalia have a typical *Chasmina* pattern, the valves are apically rounded (Fig. 1c). Phallus is short, slightly curved dorso-ventrally and acuminate at the end (Fig. 1d). Male has a large coremata, paradorsally from the base of the eighth tergite (Fig. 1e). Robinson (1974), noted this structure as pair of bright mint-green “powder-puffs” [but, did he mean a living specimen] for, exclusively, diagnostic features of the species. It is strange that Holloway (1989) did not mention the coremata in his description of the *C. candida* male, but noted that coremata presents only in three other *Chasmina* species. In general, the male genitalia of specimens from Praslin Island are similar to those from the Fiji archipelago (Holloway 1989: 187, Fig. 358) and Japan (Kishida 2006: 284, Fig. 3). The female genitalia (Fig. 1f) are identical to those of specimens from the Cocos (Keeling) Islands of Australia (Holloway 1989: 187, Fig. 360).

**Field observation data.** This was a very common species at the locality during the period 4<sup>th</sup>–22<sup>nd</sup> January 2013. The individuals were recorded daily near the electric lamps of the Sea View Lodge Hotel and closest coastal local houses on the Anse Possession (Fig. 1g). Usually, 3–5 specimens were seen near each lamp per night (max. 10 ex., 17<sup>th</sup> January).



**Figure 1.** *Chasmina candida* (Walker, 1865): Seychelles, Praslin Island, Anse Possession, January 2013.  
 a) Male specimen (upperside).  
 b) Female specimen (upperside).  
 c) Male genitalia (ventral view).  
 d) Male phallus (lateral view).  
 e) Male coremata (dorsal view, removed from the abdomen and straightened).  
 f) Female genitalia (ventral view).  
 g) Live male specimen attracted to light of a local house.  
 h) Habitat of the population: beach crest on the Anse Possession with the host plant *Thespecia populnea* (L.) Sol. ex Corrêa (in the fore of the image).

Moreover, the species was the most abundant representative among Macrolepidoptera during the observation period. All discovered specimens were clean or little damaged, which indicated their local emergence (see Fig. 1g).

**Habitat and expected range of population.** The discovered population inhabited a narrow beach crest at Anse Possession and adjacent capes, where there is a different type of coastal ecosystem, associated with sandy and rocky sites, and freshwater stream mouths. Sparse mixed forests with bush patches are the most widespread community in this area. The common plant species are *Calophyllum inophyllum* L. (Calophyllaceae), *Terminalia catappa* L. (Combretaceae), *Heritiera littoralis* (Dryand.) Aiton. (Malvaceae), *Casuarina equisetifolia* L. (Casuarinaceae), *Cocos nucifera* L. (Arecaceae), *Cordia subcordata* Lam. (Boraginaceae), *Scaevola taccada* (Gaertn.) Roxb. (Goodeniaceae). *Thespesia populnea* is the most abundant of the two larval host plants of *C. candida* on Anse Possession; it is distributed in small patches along the seashore (Fig. 1h). We estimated that the area of occupancy of the moth population is restricted to a small site (ca. 1.5 km length, 50 m width), which has an area of approximately 0.075 km<sup>2</sup>.

## Discussion

Specimens of *C. candida* were absent in the samples of comprehensive surveys of many Seychelles islands that were provided as part of the Indian Ocean Biodiversity Assessment 2000-2005 (Gerlach & Matyot 2006). The species was not observed on Cousine Island (Lawrence 2005) which is situated at ca. 5 km SW from Praslin Island. Woods (2013) actively studied Lepidoptera for the period 9<sup>th</sup> April to 13<sup>th</sup> September 2013 at the site of a former leper colony, on the south coast of Curieuse Island, which is located in front of Anse Possession, with a minimal distance between them of only 2–2.5 km. *C. candida* specimens were also not recorded. Thus, the Anse Possession population is local, and specimens were not found in other areas, including the nearest islands. The host plant *Thespesia populnea* within patches on the seafront are the main source for existence of the moth population (see Fig. 1h).

The species life cycle is poorly studied but, usually, imagoes were observed in January, including our data, with samples from the Andaman Islands (Veenakumari & Prashanth 2009) and Singapore (Leong 2010). The last instar larva of the species collected in Singapore was pupated on 19<sup>th</sup> May and imago emerged on 31<sup>st</sup> May (Leong 2010).

With respect to our data, the Seychelles population of *C. candida* can be categorised as Vulnerable (D1 – small population, D2 – restricted range). Anse Possession does not belong to protected areas, and the species population may be threatened after construction of hotels and local houses, that may decrease the host plant abundance.

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