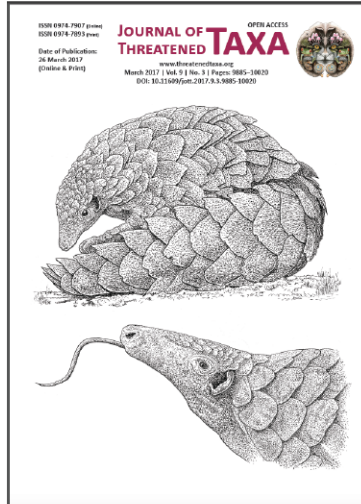


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Journal of Threatened Taxa

Building evidence for conservation globally

www.threatenedtaxa.org

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

NOTE

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Tharaka Sudesh Priyadarshana & Ishara Harshajith Wijewardhane

26 March 2017 | Vol. 9 | No. 3 | Pp. 10011–10013
10.11609/jott.1991.9.3.10011-10013



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**LIFECYCLE AND FECULA MEASUREMENTS OF
CHERITRA FREJA (LEPIDOPTERA: LYCAENIDAE),
AS RELEVANT TO THE DIFFERENT LARVAL STAGES**

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Cheritra freja pseudojafra Moore, [1881] is an endemic subspecies (MOE 2012) and Vulnerable (Van der Poorten 2012) in Sri Lanka, ‘This butterfly occurs predominantly at the interface between wet and dry zones, and in the low country wet zones up to about 2000 feet’ (609m) (d’Abrera 1998). Jayasinghe et al. (2014) lists the larval foodplants in Sri Lanka as *Entada rheedii* (Fabaceae) and *Cinnamomum verum* (Lauraceae). We observed egg laying on *C. verum* (Image 1A) at Ketepola Village (6°42.008’N & 80°14.496’E) in Ratnapura District, Sabaragamuwa Province, on 06 June 2013 and also observed eggs on *E. rheedii* at Jambolagayata Ambalama area (6.831213’N & 80.439705’E), Adam’s Peak, kuruwita-erathna footpath in Ratnapura District, Sabaragamuwa Province, on 15 November 2014. These areas belong to the wet zone (Ashton et al 1997).

Eggs were observed being laid singly on the fresh branchlets or the undersurface of tender leaves of the larval food plants. Usually, there are two or three eggs laid by the adult butterfly, however once we observed

six eggs on fresh branchlets of *C. verum* and once we observed five eggs on fresh branchlets of *E. rheedii*. Eggs are whitish in color and spherical in shape. There are little indentations on the surface similar to those on a golf ball (Image 1B). The egg is 0.96±0.05 mm in diameter (n=12). Embryogenesis lasts two to three days (from ovipositing to hatching). First-instar larvae have a lime green color body with whitish hairs (Image 1C), which appear much shorter as the second stage approaches. The mature first-instar larva is 2.28±0.58 mm in length (n=12) and takes two to three days to develop. Second-instar larvae are overall creamy-whitish brown (Image 1D), and have conical oblique projections on the dorsum of the first six abdominal segments (Tan & Khoon 2012). Later, the second-instars become whitish pale brown (Image 1E,F). The mature second-instar larva is 5.45±0.22 mm in length (n=11) and takes two days to develop. Third-instar larvae are overall lime green with purplish-pink and bumps are brown colored dorsally and laterally (Image 1G,H). The mature third-instar larva is 10.82±0.75 mm in length (n=11) and takes three days to develop. Fourth-instar larvae are overall bright purplish-pink with lime green and bumps are brownish-black colored dorsally and laterally (Image 1I,J,K). The mature fourth-instar larva is 21.5±0.53 mm in length (n=10) and takes three to four days to develop. Fifth (final)-instar larvae are overall pale purplish-pink with lime green and bumps are brownish-black colored dorsally and laterally (Image 1L,M,N), measure 19.6±0.67 mm in length at maturity (n=10), and take three days to develop. According to our study, however, the color



ISSN 0974-7907 (Online)
ISSN 0974-7893 (Print)

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DOI: <http://doi.org/10.11609/jott.1991.9.3.10011-10013> | ZooBank: urn:lsid:zoobank.org:pub:3EE0CF36-8B9E-4FEE-BEDD-3D48D1D89406

Editor: Anonymity requested.

Date of publication: 26 March 2017 (online & print)

Manuscript details: Ms # 1991 | Received 05 May 2015 | Final received 24 February 2017 | Finally accepted 03 March 2017

Citation: Priyadarshana, T.S. & I.H. Wijewardhane (2017). Lifecycle and fecula measurements of *Cheritra freja* (Lepidoptera: Lycaenidae), as relevant to the different larval stages. *Journal of Threatened Taxa* 9(3): 10011–10013; <http://doi.org/10.11609/jott.1991.9.3.10011-10013>

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Funding: Self-funded.

Competing interests: The authors declare no competing interests.

Acknowledgements: We wish to thank Keith V. Wolfe (Antioch, California) for commenting on the first manuscript. We also thank Bushana Kalhara, Rohana Gunawardna and Leena Priya Segaran (National University of Singapore) for the support.



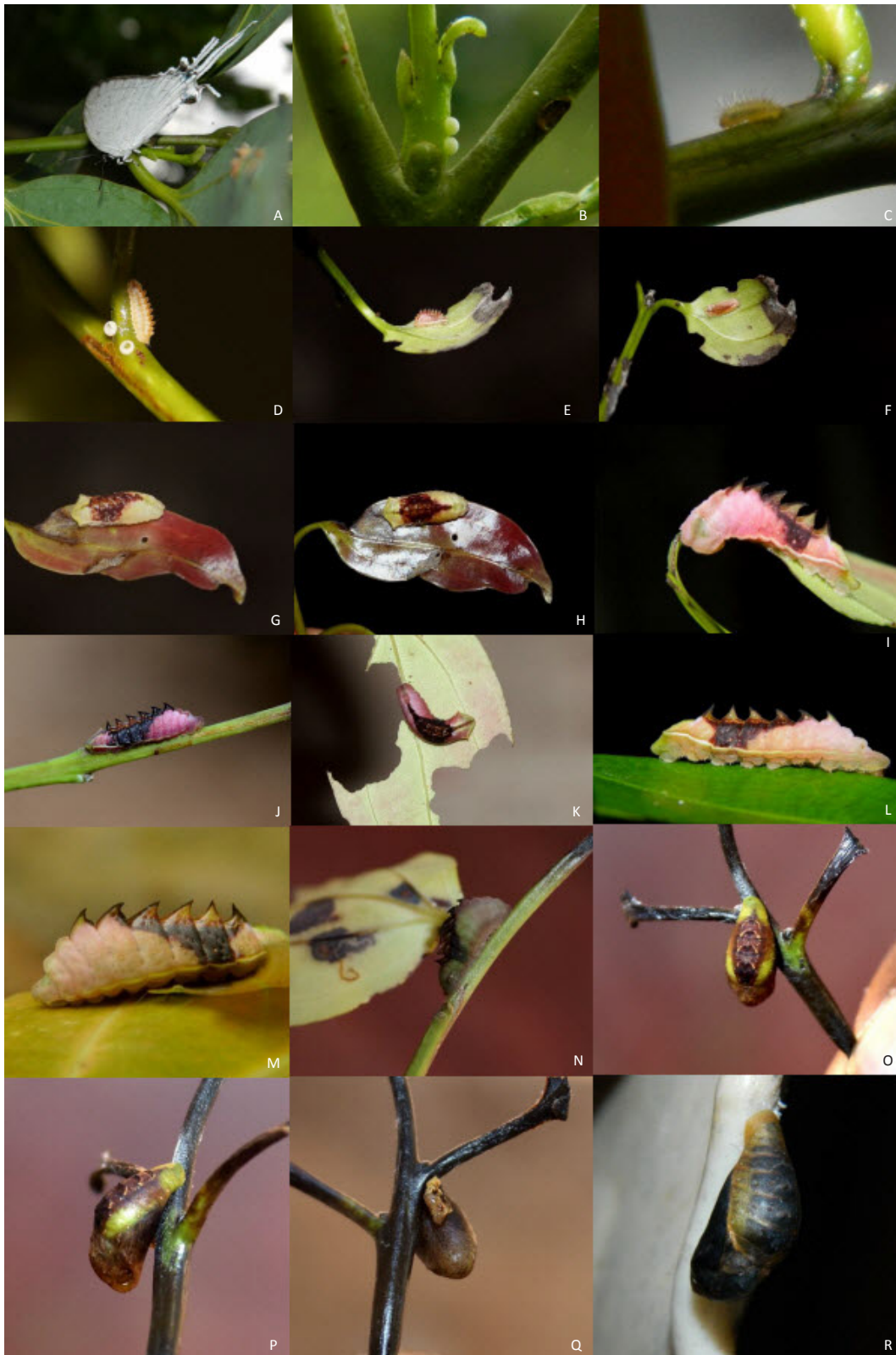


Image 1. *Cheritra freja* Immature stages

A - Egg laying on *Cinnamomum verum* branchlets; B - Eggs; C - First-instar, D - Early second-instar; E - Lateral view of latter second-instar; F - Dorsal view of latter second-instar; G - Lateral view of third-instar; H - Dorsal view of third-instar; I - Front view of fourth-instar; J - Lateral view of fourth-instar; K - Dorsal view of fourth-instar; L - Early fifth (final)-instar; M - Latter fifth (final)-instar; N - Just before the pupation; O - Front view of pupa; P - Lateral view of pupa; Q - Under-surface of pupa; R - Pupa is becoming to elusion.

© Ishara Harshajith Wijewardana (A,B,C,I,M,R) & Tharaka Sudesh Priyadarshana (others).

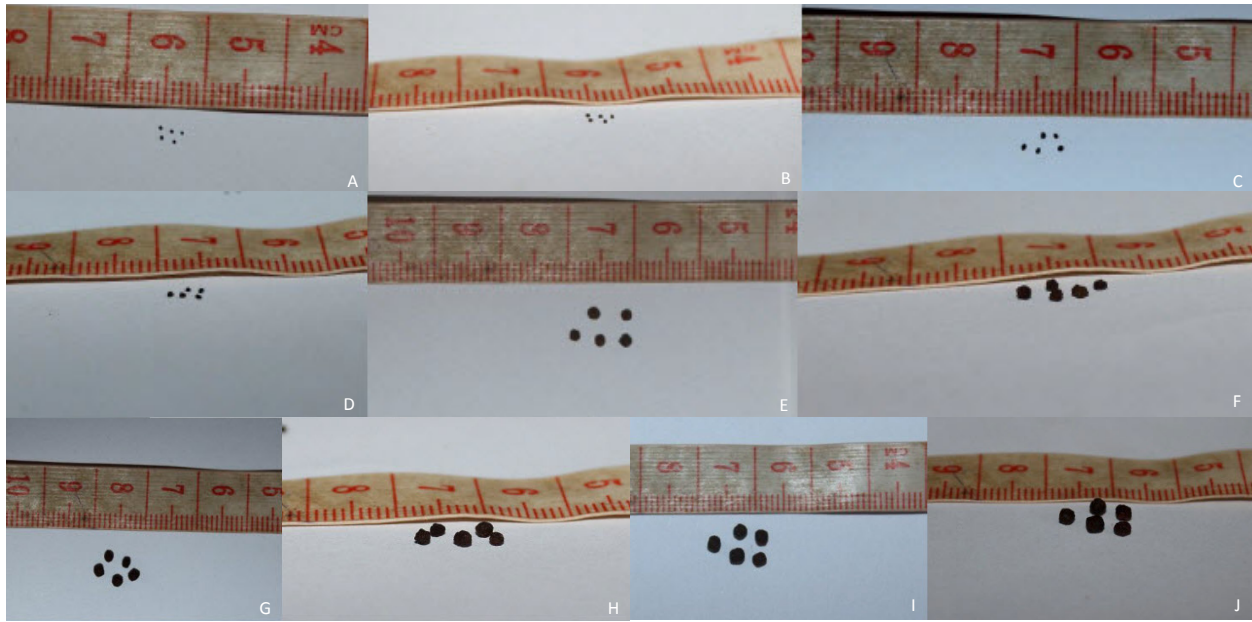


Image 2. Fecula of *Cheritra freja* when fed on *Cinnamomum verum*

A - Dorsal view of first-instar; B - Lateral view of first-instar; C - Dorsal view of second-instar; D - Lateral view of second-instar; E - Dorsal view of third-instar; F - Lateral view of third-instar; G - Dorsal view of fourth-instar; H - Lateral view of fourth-instar; I - Dorsal view of the fifth (final)-instar; J - Lateral view of the fifth (final)-instar. © Tharaka Sudesh Priyadarshana.

of all larval stages depended on the leaf being eaten. Overall, there were two color forms observed: purplish-pink and lime green. All larvae stages feed on the young or immature leaf of the foodplant (Tan & Khoon 2012). Pupae is green colored in the abdomen, 'dark brown to black in the thorax and wing pads (Image 1O), and has a whitish dorsal patch in the abdomen' (Image 1P) (Tan & Khoon 2012). The underside of pupae is entirely oily purplish-brown (Image 1Q). The pupation occurred on branches of the food plant during lab rearing and 'pupa secures itself to the plant via a silk girdle and a cremastral attachment' (Tan & Khoon 2012). Pupae become dull in color when elusion is near (Image 1R). The pupa is 11.2 ± 0.79 mm in length ($n=10$) and takes six to eight days to completely develop with the whole lifecycle (oviposition to adult) lasting 21 to 26 days.

Fecula measurements: The fecula of *C. freja* is round in shape and oily dark brown in color when released from the larva's anus, and typically soon turns black. We used white paper placed on the bottom of rearing containers to collect the fecula of different instars, then measured the diameter of each sample with a Vernier caliper that was photographed in the same frame. The diameter of the first-instar larvae measured 0.33 ± 0.13 mm ($n=10$, $N=5$) (Image 2A,B). The second-instar; 0.71 ± 0.07 mm ($n=10$, $N=5$) (Image 2C,D). The third-instar; 1.31 ± 0.1 mm ($n=10$, $N=5$) (Image 2E,F). The fourth-instar; 1.83 ± 0.08 mm ($n=10$, $N=5$) (Image 2G,H) and the fifth (final)-instar

larvae; 1.99 ± 0.09 mm ($n=10$, $N=5$) (Image 2I,J).

Butterfly larvae are well adapted to hiding among their food plants, therefore being very difficult to find. Leaf damage, feeding pattern, and fecula can be utilized to locate them. Fecula can be found around larval food plants, such as on the immediate leaf, surrounding lower vegetation, and the ground. In theory, this concept can be particularly helpful in locating rare and very rare species, especially after similar studies have been conducted with various larval stages of many different butterflies.

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ISSN 0974-7907 (Online); ISSN 0974-7893 (Print)

March 2017 | Vol. 9 | No. 3 | Pages: 9885–10020

Date of Publication: 26 March 2017 (Online & Print)

DOI: 10.11609/jott.2017.9.3.9885-10020

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