

## ***Leptomantis fasciatus* (Boulenger, 1895) as a possible nuptial gift offered by a male Raffles's Malkoha, *Rhinorhina chlorophaea* (Raffles, 1822)**

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A nuptial gift in nature is generally a courtship offering, such as nutritional materials or secretions, that is presented by one partner to the desired mate as a prelude to sexual reproduction. Such an offering may serve to improve reproductive fitness of the donor and, frequently, of the recipient as well (see Lewis and South, 2012). The phenomenon is not uncommon and known from a variety of invertebrate groups, as diverse as molluscs, insects, and spiders (Albo and Costa, 2010; Pauchet et al., 2015), and it has been more rarely reported in birds (Lack, 1940; Lewis et al., 2014).

On 21 May 2017, the rhacophorid frog *Leptomantis fasciatus* (Boulenger, 1895) was observed and photographed in the bill of a male Raffles's Malkoha, *Rhinorhina chlorophaea* (Fig. 1), a 30-cm passerine related to cuckoos (family Cuculidae), during courtship, close to the canopy of a hill dipterocarp forest on Borneo. This bird is distributed from Myanmar and Thailand, south through the Malay Peninsula, to Sumatra and Borneo and associated islands (Smythies, 1999: 328). Weather conditions at the time of these observation were bright overcast, and a sequence of 66 images was recorded using a Canon EOS 1D X MkIII camera, mounted with a EF500mm f4/L ISII USM lens, with 1.4x III converter, for a focal distance of 700 mm. These were taken as part of natural history observations from the canopy walkway for about five hours a day, during 7–14 days, conducted five times a year, over a five-year period. In the following description, times related to the

encounter are indicated as hours, minutes, and seconds (hh:mm:ss). The entire encounter is documented in Appendix I.

During the current observation, the male bird placed itself on the base of the outstretched wings of the female while holding the frog transversely across its pectoral-scapular region. The observation took place at a height of ca. 36 m above ground, within a primary mixed dipterocarp forest at the Belalong Canopy Walkway (4.5518°N, 115.1603°E; WGS 84), within the Ulu Temburong National Park, Temburong District, Brunei Darussalam. The pair was first sighted at 8:17:50.76 h, with the female in open view and perched on a semi-horizontal branch and the male largely concealed by leaves, ca. 30 cm to the left of the female.

About one third of a second later (at 8:17:51.11 h), the male changed its position slightly and revealed the frog in its bill, as viewed by the observers through an incomplete screen of twigs and leaves. At 8:17:51.71 h, the male appeared to present the frog to the female, holding the frog laterally to the female, dorsally to the camera. Just under one second later (at 8:17:52.60 h), the male mounted the wings of the female, which she held in a sub-horizontal position. The male stood laterally to the body of the female so that the left lateral view of male and frontal view of female were captured. The male then turned its body so as to be nearly parallel to that of the female. At 8:17:53.20 h, roughly 2.5 s after the birds were first sighted, mating was presumed to have started, with the male mounted over the body of the female. Mating lasted for a total of 1.67 s, until 8:17:54.87 h when the bird's posture changed. About half a second later, the male unmounted to the right of the female, still holding the frog. About 10 s later, the male moved behind the female. Another second later, he leapt forward with the frog in its beak to a near-vertical branch a few centimetres away, and a fraction of a second later he leapt to another branch, ca. 35 cm away. About 26 s later, the birds had swapped positions,

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