

THE TAXONOMIC POSITION OF THE
HORNBILL *RHYTICEROS PLICATUS*
SUBRUFICOLLIS (BLYTH) AS
INDICATED BY THE MALLOPHAGA

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Sanft (1953) regarded *Aceros subruficollis* (Blyth) as synonymous with *A. undulatus* (Shaw). He found that one specimen from SW Siam matched the four characters commonly used to identify *A. subruficollis*, but 15 specimens from other areas had mixed characters for the two species. He stated that, among others, Peters (1945) and Delacour (1947) "agree in considering *Aceros subruficollis* (Blyth) a valid species. . . ." However, both Peters and Delacour listed *subruficollis* as a subspecies of *plicatus*. Deignan (1963) divided the genus *Aceros* into *Aceros* and *Rhyticeros*, and kept *R. plicatus subruficollis* and *R. u. undulatus* in two distinct species.

The present study was made in memory of H. G. Deignan, who was pleased that his opinion would seem to be confirmed by the amblyceran Mallophaga. *Chapinia boonsongi* Elbel was found on both subspecies of *Rhyticeros undulatus* in the Oriental region, and *C. hirta* (Rudow) was found on *R. plicatus subruficollis*. These two species of *Chapinia* were so different that Elbel (1967) placed them in different species groups. This would suggest that the birds have been separated for a considerable length of time. Kellogg (1896) stated that Mallophaga spent their entire lives on the host bird and that infestation of new hosts was accomplished by the actual migration of individuals from one bird to another during copulation, nesting, or roosting. However, if the bird populations became isolated so that they could not interbreed, the Mallophaga would be isolated on the host population and could not interbreed with lice of different host populations. With time and isolation, both host and Mallophaga might separate into different species (Elbel and Emerson 1959).

Sanft's opinion would seem to be confirmed by

the ischnoceran Mallophaga since the same species of lice were found on both hosts. *Buceronirmus* new species 1 and *Paroncophorus javanicus* (Rudow) were found on both subspecies of *Rhyticeros undulatus* and on *R. plicatus subruficollis* (Elbel, unpublished). If these two hosts represent distinct species, the ischnoceran genera *Buceronirmus* and *Paroncophorus* have not speciated as rapidly as the amblyceran genus *Chapinia*. Clay (1957) stated that rates of speciation have been so different in the Amblycera and Ischnocera that comparisons of these rates on the same host group have little value. If the hosts, *R. undulatus* and *R. p. subruficollis*, represent the same species, the amblyceran lice, *Chapinia boonsongi* and *C. hirta*, must have been sympatric species on both host populations. Suppose that *C. boonsongi* became extinct on *R. p. subruficollis* and that *C. hirta* became extinct on *R. undulatus*. Then the two forms of *Rhyticeros* would be closer than their Mallophaga indicated. Clay (1949) was the first to mention this type of distribution. The fact that two species of *Chapinia* have not been found on any hornbill (Elbel 1967) would seem to suggest that sympatric pairs were not involved and that the hosts should remain as distinct species. However, as mentioned by Clay (1957), the evidence of relationship provided by one genus of Mallophaga is less convincing than if more genera were involved.

In the Australian region a different relationship was found. *Buceronirmus* new species 2, *Chapinia hirta*, and *Paroncophorus javanicus* were found on all subspecies of *Rhyticeros plicatus* (Elbel, unpublished). The speciation that has occurred in the *Buceronirmus* would suggest that the Australian forms of *R. plicatus* have become isolated from the Oriental *R. p. subruficollis* and thus should be specifically distinct; but again the evidence of relationship provided by one genus of Mallophaga is less convincing than if more genera were involved. Clay (1949) stated that if one of the louse species of a host species with an extensive range became extinct in the middle portion of that range, the two louse populations at either end would be isolated, and that by the time the louse species again spread throughout the population of the host, some kind of sexual isolating mechanism might have developed in one of the louse populations. If this were the case, one would expect to find both

species of *Buceronirmus* on the same subspecies of *R. plicatus* somewhere within its range. Since this has not been found, perhaps critical ornithological work will show that *R. p. subruficollis* is reproductively isolated and should be separated specifically from the subspecies of *R. plicatus* in the Australian region.

In these two examples the mallophaga afford a suggestion as to the distinctiveness of the host *Rhyticeros plicatus subruficollis*. Mallophaga are considered only as contributory evidence to the morphological and biological data from the host birds (Elbel and Emerson 1959).

In summary, Mallophagan evidence suggests that *subruficollis* is not a synonym of *Rhyticeros undulatus* as Sanft (1953) thought, and may in fact, be specifically distinct from *plicatus*, of which *subruficollis* has been considered a subspecies by recent authors.

LITERATURE CITED

- CLAY, T. 1949. Some problems in the evolution of a group of ectoparasites. *Evolution* 3:279-299.
- CLAY, T. 1957. The Mallophaga of birds. p. 120-158 *In* First Symposium on host specificity among parasites of vertebrates. I.U.B.S. and University of Neuchâtel, Neuchâtel.
- DEIGNAN, H. G. 1963. Checklist of the birds of Thailand. U.S. Natl. Mus., Bull. 226.
- DELACOUR, J. 1947. Birds of Malaysia. New York, Macmillan.
- ELBEL, R. E. 1967. Amblyceran Mallophaga (biting lice) found on the Bucerotidae (Hornbills). *Proc. U. S. Natl. Mus.* 120:1-76.
- ELBEL, R. E. AND K. C. EMERSON. 1959. The taxonomic position of an Asiatic species of *Otus* (Aves: Strigiformes) as indicated by the Mallophaga. *Proc. Oklahoma Acad. Sci.* 39:76-78.
- KELLOGG, V. L. 1896. New Mallophaga. I: With special reference to a collection made from maritime birds of the bay of Monterey, California. *Proc. California Acad. Sci.* 6:31-182.
- PETERS, J. L. 1945. Bucerotidae. p. 254-272. *In* Check-list of the birds of the world. Vol. 5. Harvard University Press, Cambridge.
- SANFT, K. 1953. On the status of the Hornbill *Aceros subruficollis* (Blyth). *Ibis* 95:702-703.

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