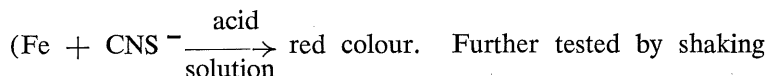


## PLUMAGE STAINS ON WILD DUCKS IN NORTH QUEENSLAND

Serventy (1960) has discussed waterfowl, including two specimens of "the Black Duck *Anas poecilorhyncha*" in Western Australia, exhibiting ferric discoloration.

During 1961 related field observations on wild ducks were made in coastal North Queensland from Bowen to Ingham, and the plumage of eight birds (four species) was subjected to the following chemical tests:

- (a) A known mass of feathers was added to 5 ml of 10N hydrochloric acid for 5 min, stirred for 2 min and 5 ml of distilled water then added. This was mechanically shaken for 30 min. A further 25 ml of distilled water was added and the whole shaken for 20 min. The suspension was filtered and the residue washed with 15 ml of distilled water. To each filtrate complete, 50 ml 0.1 molar ammonium thiocyanate (in 1N hydrochloric acid) was added and a colorimeter reading taken immediately.



the red solution with ether when iron will be extracted to yield a red ether solution.)

A series of standards was prepared by dissolving a known mass of ferric nitrate in 500 ml of 1N hydrochloric acid and in each case taking a fixed volume (for example, 2 ml) and diluting to 100 ml in 0.1 molar ammonium thiocyanate (in 1N hydrochloric acid).

- (b) The filtrates from feathers dissolved in 10N hydrochloric acid for 5 min were added to a solution of  $\infty$ ,  $\infty^1$  dipyriddy.

(Fe ++ salts react to give a red colour; Fe +++ salts will not react under these conditions.)

The following five species were recorded with plumage stains: grey teal, *Anas gibberifrons gracilis* Buller; black duck, *Anas superciliosa rogersi* Mathews; radjah shelduck, *Tadorna radjah rufitergum* Harter; pink-eared duck, *Malacorhynchus membranaceus* (Latham); and pied goose, *Anseranas semipalmata* (Latham). These, unlike other species, spend most of their time resting and feeding on shallow freshwater, repeatedly submerging the lower body and underhead. Feathers stained were usually those of the breast, chest, foreneck, throat, chin and cheek. Discolouration of individual feathers was mainly marginal, the extent depending on the degree. The cause, as demonstrated by the chemical tests, was iron as ferric oxide deposited as a film, and amounts on individual ducks in relation to the degree of staining are given in Table 1.

TABLE 1

PLUMAGE STAIN: AMOUNT OF FERRIC OXIDE DEPOSITED AND DEGREE OF STAIN  
(All specimens collected during November 1961)

Specimen No.	Species	Locality	Ferric Oxide Deposited*	Degree of Stain
1	<i>A. g. gracilis</i>	Black Weir, Ross River, Townsville .. ..	44	Heavy
2	<i>D. eytoni</i>	Mount St. John, Townsville .. ..	Trace	Nil
3	<i>A. g. gracilis</i>	Ross River, Oonoonba, Townsville† .. ..	Trace	Nil
4	<i>A. s. rogersi</i>	Goose Lagoon, Burnside, via Ingham .. ..	17	Medium
5	<i>A. s. rogersi</i>	Mount St. John, Townsville .. ..	136	Heavy
6	<i>A. g. gracilis</i>	Black Weir, Ross River, Townsville .. ..	132	Heavy
7	<i>A. s. rogersi</i>	Goose Lagoon, Burnside, via Ingham .. ..	38	Medium
8	<i>C. jubata</i>	Upper Ross River, Townsville .. ..	3	Nil

\* mg Fe +++ per g weight of feathers

† Saline habitat

Ducks on other major habitat types were not discoloured—as examples: the land-grazing maned wood duck, *Chenonetta jubata* (Latham), and plumed whistling duck, *Dendrocygna eytoni* (Eyton); the deep, freshwater inhabitants such as the white-eyed duck, *Aythya australis australis* (Eyton), and green pygmy goose, *Nettapus pulchellus* Gould; and sample catches from large flocks of grey teal that used the saltwater habitats of Cleveland Bay and lower Ross River as drought refuge from April to October 1961.

Plumage stains on wild ducks in North Queensland are the result of a steady deposition of iron, as ferric oxide, on those feathers constantly exposed to shallow fresh water. It remains to be shown at what levels of concentration the iron is deposited to cause staining, and the distribution of habitats on which staining may occur.

The assistance of Mr. J. T. Baker (Senior Lecturer in Chemistry, University College of Townsville) is gratefully acknowledged.

#### REFERENCE

SERVENTY, D. L. (1960).—Ferric staining on waterfowl. *W. Aust. Nat.* 2:96.

H. J. LAVERY,  
Queensland Department of Agriculture and Stock

(Received for publication May 10, 1962)