

PTERYLOSIS OF THE BLACK VULTURE

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THIS study is a supplement to the work of Compton (Univ. California Publ. Zool., 42: 173-212, 1938) and of Miller and Fisher (Condor, 40: 248-256, 1938) on the pterylography of cathartid vultures. Since neither of these papers considered the Black Vulture, *Coragyps atratus*, a brief comparison of the pterylosis of *Cathartes*, *Gymnogyps*, and *Coragyps* would seem to be worth while. I am grateful to Dr. William L. Engels of the University of North Carolina for sending me the alcoholic specimen of *Coragyps* (no. 76131, Mus. Vert. Zool.). The nomenclature and order of description of the above papers will be used to facilitate comparative study.

Capital tract.—In the Black Vulture there are feathers over most of the head. This is in direct contrast to the reduced feathering of *Gymnogyps*. *Cathartes* has short hair-like feathers on the head but no plumaceous feathers. Despite the reduced covering in *Gymnogyps*, the feathers of the frontal, loreal, anterior superciliary, and parts of the auricular and malar regions are plumaceous.

In *Coragyps* the plumaceous feathers of the lower occipital region, which is continuous with the dorsal cervical region, range up to 2.5 cm. in length. Semi-plumaceous feathering continues forward over the coronal region with the feathers 5-8 mm. in length and about 1 mm. apart. From posterior to anterior, the bristle-like feathers of the frontal region decrease in length to 3 mm. and become much finer. The spacing is approximately the same as in the coronal region. The frontal region ends 2 or 3 mm. back of the posterior ends of the nasal openings.

The lower part of the loreal region is devoid of feathers, but the upper part has bristles continuous with those of the frontal region. Close-set bristles, about 5-7 mm. long, cover the auricular region. This region is confluent with the coronal region dorsally and the malar region ventrally where the spacing is greater. The posterior part of the auricular region is made up of two or three rows of short bristles set posteroventrally about the external auditory meatus. In the posterior auricular region the feathers are short and about 2 mm. apart.

In the anterior inter-ramal area is an apterium that extends posteriorly from the symphysis for 2 cm. Only scattered feathers are found in the submalar area.

The bristles of the frontal region become shorter and slightly farther apart as they extend out over the superciliary region. The upper and lower ocular apteria meet posterior and anterior to the eye. In the latter instance they continue together over the loreal region almost to the corner of the mouth.

A single row of eyelashes runs along the posterior one-half of the upper eyelid. Two rows may be seen along the margin of the lower lid. *Cathartes* has this arrangement, but *Gymnogyps* has no eyelashes.

Gymnogyps has a greater area on the head devoid of feathers than either *Cathartes* or *Coragyps*. Reduction in capital covering in *Gymnogyps* has taken the form of almost complete removal of feathers in certain areas (coronal, auricular, inter-ramal and ocular), with alteration in size of other feathers. In *Cathartes* reduction has been general in all the feathers, but few have been completely eliminated. *Coragyps* shows some reduction in the plumaceous condition of head feathers, but the spacing is approximately the same as in *Cathartes*. It is interesting that extreme reduction should take place in the coronal region of *Gymnogyps* and that the loreal region should have plumaceous feathers. The opposite condition is found in *Coragyps* in that the coronal region is heavily covered with plumaceous feathers whereas the loreal region has only bristles. The bristles of the loreal region in *Cathartes* are more numerous than elsewhere on the head.

Spinal tract.—The description of this tract in the California Condor by Miller and Fisher (*loc. cit.*) expresses the condition in *Coragyps* with four exceptions. In *Coragyps* the anterior dorsal cervical region is heavily covered with plumaceous feathers which blend in with the feathers of the ruff. The median apterium in the interscapular region is narrower and shorter. Posteriorly the spinal tract does not narrow down until within 2.5 cm. of the oil gland. At this point it is six feathers wide. Only three feathers are found posterior to this point before the tract ends 0.5 cm. anterior to the base of the oil gland. There are feathers on the midline in the pelvic region.

Coragyps differs from *Cathartes aura* and *Gymnogyps* in having plumaceous feathers in the extreme anterior part of the spinal tract. Also, the apterium between the interscapular areas in the two latter forms is larger than in *Coragyps*. The ruff is much less prominent in *Coragyps* than in *Gymnogyps* and appears to be intermediate between the evident ruff in *Gymnogyps* and the very slight ruff in *Cathartes*.

The postpelvic region in *Coragyps* and *Cathartes* is represented by two or three feathers. Even these are gone in *Gymnogyps*.

Ventral tract.—At the junction of the ventral cervical and the sparsely covered submalar region is an apterium about 1 cm. in diameter. Extending back from this to the level of the shoulders is a narrow strip of semi-plumaceous feathers with plumaceous ruff feathers intermingled. This area corresponds to the median ventral cervical apterium.

The midventral apterium starts about 2 cm. posterior to the shoulder region and extends to the anus. It ranges from 1.5 to 2.5 cm. in width.

Each branch of the sternal region splits lateral to the keel, three rows of

feathers continuing laterally around a sternal apterium and joining the main central tract after a short interval. The two continue together toward the anus in a band of decreasing width. The sternal apterium is not as pronounced in *Coragyps* as in *Gymnogyps*, but it is much more noticeable than in *Cathartes*. In this one specimen of *Coragyps* the apterium on the right side was just visible. The one on the left was approximately 2.5 cm. long and 1.5 cm. wide. Compton did not find this apterium in *Cathartes*, but Nitzsch (*Pterylography*, 1867, p. 51) mentions it. Examination of several skins and one alcoholic specimen of *Cathartes* shows a vestigial apterium. The feathers are farther apart here, and in some cases one or two seem to be missing.

Nitzsch found a prominent insular apterium in *Sarcoramphus papa*, a small apterium in *Coragyps atratus*, and faintly visible apteria in *Cathartes* and *Vultur gryphus*. *Gymnogyps* has a very prominent sternal apterium on each side. Thus the sternal apterium is to be found in all the New World vultures but in varying degrees of development.

Caudal tract.—This tract in *Coragyps* in many details corresponds to the cathartid pattern. One difference is that in *Cathartes aura* and *Coragyps* the anal circlet is incomplete, whereas in *Gymnogyps* it is complete and there are one or two incomplete outer anal circlets as in *Coragyps*. *Cathartes* has no outer circlets.

In *Coragyps* I found seven down feathers, 4–5 mm. long, on the oil gland. In the two other forms the gland is completely nude.

Gymnogyps and *Coragyps* agree in having three minor under tail-coverts arranged in a single row. In *Coragyps*, however, there is no indication of an additional series of minor under coverts. Single feathers on either side in *Gymnogyps* may be remnants of such a series. There are six minor under coverts in a single row in *Cathartes*, and laterally a single feather of another series is present.

Patagia at the bases of the rectrices are lacking in all three genera.

Humeral tract.—In *Coragyps* as in *Gymnogyps* there is a prominent apterium between the feathers of the humeral tract and the marginal and lesser coverts. The posterior six or seven rows of feathers in the humeral tract are separated from the coverts in *Coragyps*; five rows are thus separated in *Gymnogyps*. The apterium is hardly discernible in *Cathartes aura*.

Coragyps has one or two more feathers than *C. aura* in each transverse row. Six is the common number. The last row consists of seven feathers, two inner and one outer feather that are small, with four large central feathers. *Gymnogyps* and *Coragyps* are very much alike in this region and differ from most Falconiformes in having six or seven feathers in the transverse rows.

Alar tract.—The arrangement of feathers is the same in the three genera.

There are 11 primaries, 10 greater upper primary coverts, and 11 under primary coverts in each. *Cathartes* has 18 secondaries with 19 upper coverts and 18 under coverts. In *Coragyps* 19 secondaries, 20 greater upper secondary coverts and 19 under secondary coverts are present. *Gymnogyps* has the greatest number of secondaries, 22, with 23 upper and 22 under coverts. Nine tertiaries are present in *Coragyps* and *Cathartes*, but 10 are to be found in *Gymnogyps*.

The claw of the alula is curved in *Gymnogyps* and *Coragyps*, but it is straight in *Cathartes aura*. In my alcoholic specimen of *Coragyps* the claws measure 5.2 mm. and 7.0 mm. On two skins the claws averaged 6.1 mm. in length. Of special interest in the alcoholic specimen of *Coragyps* is the presence of another claw at the end of the second digit. It measures 4.0 mm. on the left and 5.0 mm. on the right wing. On the two skins of *Coragyps* this claw could not be found. Neither could it be found on six skins of *Gymnogyps* nor on a series of study skins of *Cathartes*.

Femoral and crural tracts.—In these three vultures these tracts are so similar that no discussion is necessary. Reference may be made to the other papers cited.

SUMMARY

Coragyps differs in several minor respects from the cathartid pattern as defined in preceding papers. It has feathers on the midline of the pelvic region. Its head is more completely covered with plumaceous feathers than is the head of *Gymnogyps*; *Cathartes* has no plumaceous feathers on the head. There are a few down feathers on the oil gland, but it is not tufted.

Features of importance that are similar in these cathartids include: arrangement of the alar and femoral tracts, lack of patagia around the quills of the rectrices and secondaries, reduction of under tail-coverts, continuous dorsal and pelvic regions and great irregularity of feather placement on the body.

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