Incidence des déformations squelettiques chez trois espèces de Gobiidae de la lagune de Bizerte (Tunisie)

par

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RÉSUMÉ. - Chez les gobies, *Gobius niger* (Linnaeus, 1758), *Gobius paganellus* (Linnaeus, 1758) et *Zosterisessor ophiocephalus* (Pallas, 1811), capturés dans la lagune de Bizerte, située à l'extrême nord-est de la Tunisie, nous avons noté la présence de cinq types d'anomalies vertébrales : une cyphose abdominale, une cyphose caudale, une lordose, une scoliose et un tassement des vertèbres. L'incidence de ces déformations varie de 21,3% à 37,6%. La comparaison, entre espèces, des pourcentages d'individus déformés ne montre pas de différences significatives entre *Zosterisessor ophiocephalus* (25,2%) et *Gobius niger* (21,3%) ($p > 0,05$). En revanche, *G. paganellus* montre un pourcentage beaucoup plus important que chez les deux autres espèces (37,6%) et possède un degré de déformation nettement supérieur à celui qui a été observé chez *Z. ophiocephalus* et chez *Gobius niger*. Chez *Gobius paganellus*, le pourcentage des femelles déformées est plus important que celui des mâles ($p < 0,05$, par test de Chi-deux). En revanche, chez *Zosterisessor ophiocephalus* et *G. niger*, le taux de déformations ne semble pas fluctuer selon le sexe. En outre, les types de déformations varient selon l'espèce. En effet, chez *Z. ophiocephalus* et *G. niger*, nous avons observé des tassements de vertèbres dans la région caudale. Ceux-ci sont absents chez *G. paganellus*. Ces résultats suggèrent que ces trois espèces de gobies réagiraient différemment vis-à-vis des conditions environnementales génératrices de stress et/ou de la pollution qui peuvent être les causes de ce type d'anomalie.

ABSTRACT. - Incidence of skeletal deformities in three species of Gobiidae from Bizerta lagoon (Tunisia).

Skeletal deformities are well described in cultured fish. This can be induced by a variety of factors including unfavorable biotic/abiotic conditions. However, in the natural environment their frequency is relatively low. The strong correlation of fish skeletal deformities with pollution and other environmental disturbances underlines the importance of their study and their use as an indicator of pollution. This study attempt to diagnose skeletal deformities associated with Gobiidae collected from Bizerta lagoon, which are exposed to several types of pollutants. Our study relates to the three most abundant species of gobies in the Bizerta lagoon, which are *Gobius niger* (Linnaeus, 1758), *G. paganellus* (Linnaeus, 1758) and *Zosterisessor ophiocephalus* (Pallas, 1811). Fish were collected from January to June 2005, with a small trawl. The prospected depths ranged from 0.5 to 4 m. 1,342 gobies were captured. Among them, 887 belonged to *G. niger*, 141 to *G. paganellus* and 314 to *Z. ophiocephalus*. Individual body weight, standard length and total length were measured. Samples were X-ray radiographed in order to identify possible skeletal anomalies. In order to know the degree of deformity, the depth of the curve (PC), which corresponds to the distance between the tangent with the apical vertebra and the line, which passes at the basis of the two vertebrae that limits the curve, was measured. Then, we calculated the ratio (PC/LS) x100, which represents the curve degree. Five types of vertebral anomalies were observed: abdominal kyphosis, caudal kyphosis, lordosis, scoliosis and vertebral column compression. The incidence of these deformations ranged from 21.3% to 37.5%, which are considered as high values comparatively to those obtained in recent works carried out on the gobies from Tagus and Sado estuaries in Portugal and from Karin Sea in the eastern Adriatic. Our study revealed that the percentage, the degree and the types of deformities were strongly related to species. Indeed, the percentages of deformed individuals did not show significant differences between *Z. ophiocephalus* (25.2%) and *G. niger* (21.3 %) ($p > 0.05$). On the other hand, *G. paganellus* showed significantly higher values for both deformity incidences (37.6 %) and deformity degree than those of *Z. ophiocephalus* and *G. niger*. Moreover, in *Z. ophiocephalus* and *G. niger* a compression of vertebrae was observed especially in the caudal region. This was absent from *G. paganellus* individuals. Concerning the difference related to sex, in *G. paganellus* the percentage of deformed females is significantly higher than that of males ($p < 0.05$). In *Z. ophiocephalus* and *G. niger* the rate of deformation was not sex-related. These results showed that the three gobiid species seem to react differentially to the environmental stress, which could be one of the causes implied in the incidence of this type of anomaly.

Key words. - Gobiidae - *Gobius niger* - *G. paganellus* - *Zosterisessor ophiocephalus* - Bizerta Lagoon - Skeletal deformation.

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