Հայաստանի Գիտությունների Ազգային Ակադեմիա
Национальная Академия Наук Армении
National Academy of Sciences of Armenia

Հայաստանի Կենսաբանական Հանդես
Биологический Журнал Армении
Biological Journal of Armenia

• Փորձարարական և տեսական հոդվածներ • Экспериментальные и теоретические статьи •
• Experimental and theoretical articles •

Biolog. Journal of Armenia, 4 (63), 2011

EYE LENS DIAMETER AND WEIGHT AS AN AGE INDICATOR IN *RHYNCHORHAMPHUS GEORGI* (VALENCIENNES, 1846) (FAMILY: HEMIRAMPHIDAE) COLLECTED FROM THE SEA OF OMAN

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Specimens of *Rhynchorhamphus georgi* have been collected from waters around Muscat City at the coasts of the Sea of Oman. The ocular lens diameter and weight were tested as an additional age indicator to those already in use. The results showed that the diameter of the eye lens can be used for identifying first-year ani-mals, while the eye lens weight proved unreliable for age determination.

Eye lens diameter - eye lens weight - ageing - Rhynchorhamphus georgi - sea of Oman

Rhynchorhamphus georgi նմուշները ընտրվել էին Օմանի ծովի ափամերձ՝ Մուսկաթ Սիթին շրջապատող ջրերից: Աչքի ոսպնյակի տրամագիծն ու քաշը հետազոտվել են որպես աճի լրացուցիչ ցուցանիշ: Արդյունքները ցույց են տալիս, որ աչքի ոսպնյակի տրամագիծը կարող է օգտագործվել բացահայտելու մեկ տարեկան կենդանիներին, մինչդեռ աչքի ոսպնյակի քաշը կենդանիների տարիքը չի որոշում:

Օկուլյարի ոսպնյակի տրամագիծ - ոսպնյակի կշիռ - տարիք - Rhynchorhamphus georgi - Օմանի ծով

Образцы *Rhynchorhamphus georgi* были отобраны из вод вокруг Сити Мускат у побережья моря Оман. Диаметр и масса линзы окуляра были исследованы в качестве дополнительного возрастного показателя. Результаты показали, что диаметр глазной линзы может быть использован для выявления годовалых животных, между тем масса глазной линзы не определяет возраста животного.

Диаметр линзы окуляра - вес линзы - Rhynchorhamphus georgi - море Оман

Both eye lens diameter and eye lens weight have been used for the age determination of a variety of animals. Eye lens weight was also used for studying the effect of nutrition on the process of age determination in vertebrates [17]. In teleost fishes, studies using these eye lens parameters as age indicators include [1-3, 5-9, 11-15].

The aim of this study is to determine the validity of the eye lens diameter and weight as age indicators in the Sea of Oman fish *Rhynchorhamphus georgi*.

Materials and methods. Specimens of *Rhynchorhamphus georgi* (n= 240) were obtained from the coasts of Muscat City on the Sea of Oman. The eye lens diameter and weight were measured to the nearest millimeter and gram following [12]. The scales were used to determine the age following [13]. One way analysis of variance followed by Duncan's multiple range test [10] were applied to test the differences between the total length of the fish and its age.

Results and Discussion. Based on the scales, the age of *R. georgi* ranged from less than one year to I+ year. There was a clear overlap in the body length of different age classes, with no significant difference ($p>0.05$) (fig. 1).

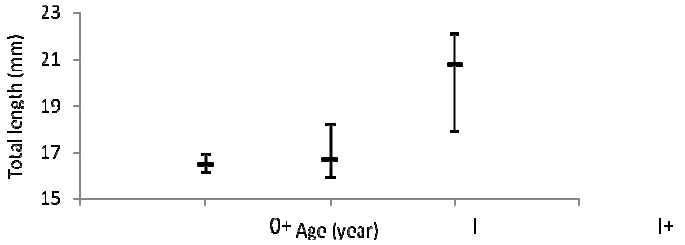

Figure 1. Total length vs age (determined from opercular bone) of *Rhynchorhamphus georgi*. Vertical bars represent range of fish total length and horizontal lines represent mean fish length.

There was a slight increase in the average lens diameter with age within different age groups. The showed that the eye lens diameter of the fish individuals that did not finished their first year of life did not overlap with the ranges of the eye lens diameter of subsequent year classes (fig. 2). The ages of fishes in year classes I & I+ could not be determined using the present technique (fig. 2).

Figure 2. Lens diameter vs age (determined from opecular bone) of *Rhynchorhamphus georgi*. Vertical bars represent total range of lens diameter and horizontal lines represent mean diameter.

Similar results were obtained for the Brown Trout, *Salmo trutta* [9] and *Lithognathus mormyrus* and *Diplodus vulgaris* [7] and *Saurida undosequamis* and *Sillago sihama* [12], [6] and [5] also failed to find such a relationship during their study of different fish species.

Different environmental factors can alter the growth rate in different fish species living in different habitats [19]. Temperature is probably the most important environmental parameter for tropical fish species as regards to their growth rate. Several authors reported on the relationship between temperature and the growth rate of fish that live in such tropical habitats [1, 15]. In such habitats, almost uniform temperature regimes dominate. *Rhynchorhamphus georgi* experiences a narrow range of variation in water temperature all year round. There is thus a great possibility that changes in growth rate in this species from different year classes cannot be detected in its eye lens diameter, and that an accurate age determination using this parameter is ultimately in-

validated. This situation is similar to fish ageing in tropical regions, where well-defined annual rings failed to appear on their scales [18].

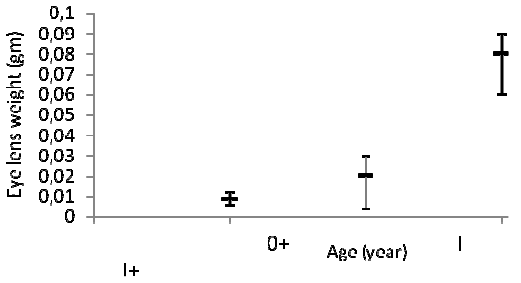

Figure 3. Lens weight vs age (determined from opercular bone) of *Rhynchorhamphus georgi*. Vertical bars represent range of lens weight and horizontal lines represent mean lens weight.

The data on *Rhynchorhamphus georgi* show complete overlap in eye lens weight among the age groups (fig. 3), precluding accurate age determination. The presence of this overlap may correlate with the development of sexual maturity [8]. During the reproductive period, energy is transformed from somatic to gonadal growth. Since the increase in lens weight is closely correlated with somatic growth, the variation in individual reproduction development (hence variation in somatic growth) could result in an increased variation in lens weight within an annual group.

ACKNOWLEDGEMENT

We would also like to thank the Ministry of Fisheries Wealth, the Agriculture and Fisheries Development Fund and Marine Science and Fisheries Centre for giving us the opportunity to work on the fish samples within the qualitative and quantitative distribution of marine organisms in Sultanate of Oman and to provide the appropriate financial support

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Received 23.07.2011