



A Study on Some Ecological Aspects of Snow Trout (*Schizothorax pelzami*) from Laiinsoo River in Northeastern Iran

Asghar Abdoli^{1*}, Pooneh Rasooli¹, Hossein Yazdandad bibalan², Leila Abdoli³

- 1- Department of Biodiversity and Ecological Management, Environmental Science Research Institute, Shahid Beheshti University
- 2- Department of Environment, Faculty of Natural Resource, Ferdowsi University of Mashhad
- 3- Department of Marin biology, Faculty of Science, Hormozgan University

Abstract

Samples of *Schizothorax pelzami* were collected by electroshocker from Laiinsoo River (n=150) in northeastern Iran in January 1995. The growth and diets rates of *S. pelzami* were examined. For 30 specimens in Laiinsoo River, the length-weight relationships were estimated as $W = -12.108 \times L^{3.134}$ ($r = 0.999$) for females and $W = -10.594 \times L^{2.796}$ ($r = 0.849$) for males. Stomach contents were examined to determine the kind, number, and volume of organisms present. Classification of the stomach contents of individual fish in Laiinsoo River revealed different groups of benthic invertebrates. Chironomidae, were the most abundant benthic invertebrates among the categories of organisms collected. The Ivelev index showed that Odonata, at 1; Chironomidae (Larva), at 0.6, and Simuliidae (larva), at 0.5, were the most important food items for *S. pelzami*. The ratio of male to female for specimens caught from Laiinsoo River was 2.5:1.

Keywords: *Schizothorax pelzami*, diet, growth, benthic invertebrate, Iran.

بررسی برخی جنبه های اکولوژیکی گونه *Schizothorax pelzami* از رودخانه لایین سو در شمال شرق ایران

اصغر عبدلی^{۱*}، پونه رسولی^۱، حسین یزدان دان بی بالان^۲،
لیلا عبدلی^۳

- ۱- گروه تنوع زیستی و مدیریت اکوسیستم ها، پژوهشکده علوم محیطی، دانشگاه شهید بهشتی
- ۲- گروه محیط زیست دانشکده منابع طبیعی، دانشگاه فردوسی مشهد
- ۳- گروه بیولوژی دریا، دانشکده علوم، دانشگاه هرمزگان

چکیده

۱۵۰ نمونه از گونه *Schizothorax pelzami* با استفاده از دستگاه الکتروشوکر در رودخانه لایین سو در شمال شرق ایران در دی ماه ۱۳۷۴ به دست آمد. میزان رشد و رژیم غذایی نمونه ها مورد بررسی قرار گرفت. رابطه طول و وزن برای ۳۰ نمونه به دست آمد، $W = -12.108 \times L^{3.134}$ ($r = 0.999$) در مورد نمونه های ماده و $W = -10.594 \times L^{2.796}$ ($r = 0.849$) در مورد نمونه های نر. نوع، تعداد و حجم محتویات معده نشان دهنده ۱۱ گروه های متفاوتی از بنتوزها می باشد که Chironomidae اکثریت غالب بنتوزها را تشکیل می دهد. نمایه ایولو نشان می دهد که Odonata؛ Chironomidae (Larva) با ۰/۶ و Simuliidae (larva) با ۰/۵ از مهمترین مواد غذایی بوده اند. میزان نسبت جنسی نر به ماده ۱: ۲/۵ می باشد. این مقاله اولین گزارش از برخی جنبه های زیست شناسی و بوم شناسی یکی از گونه های ماهیان شاخص شرق ایران می باشد. کلید واژه ها: *Schizothorax pelzami*، رژیم غذایی، رشد، بنتوز، ایران.

* Corresponding author. E-mail Address: Asabdoli@yahoo.com

Introduction

The snow trout species *Schizothorax pelzami* (Kessler, 1870) is distributed in the Tedzhen and Murgab rivers of Afghanistan and Turkmenistan including Iranian drainages of the former known as the Hari River in its Iranian reach (Aliev *et al.*, 1988). It is recorded from the Jam River, the Sharak River, the Akhland River near Mashhad, the Kashaf River and various smaller water bodies in Khorasan, the upper Kal Shur, Jajarm and Jovein rivers in the Kavir basin, as well as Cheshmeh Ali at Damghan and Cheshmeh Badash near Shahrud further west, the western most distribution of the schizothoracine fishes (Günther, 1889; Nikol'skii, 1897; 1899; Abdoli, 2000; Coad and Abdoli, 2000, Coad, 2002). About ecology and biology of inland water fishes of Iran, particularly fishes that have not commercial value little studies were carried out (Abdoli, Rahmani, Rasooli, 2000) and the snow trout is no exception. We could not find any paper about food habits of this species in Iran or other countries for comparison. This study was performed to describe feeding biology of *S.pelzami* in Laiinsoo River.

Materials and methods

Fish specimens were collected in January 1995 by using an electroshoker with 200-300 V, 50 Hertz frequency and one anode in Laiinsoo River (Table 1) that is located in south-east of Caspian Sea in Iran and all specimens were preserved in 10% formalin. At the same time, benthic invertebrates were sampled by a surber sampler 30 cm x 30 cm large and with a mesh size of about 300 μ m. In the laboratory, the total length and weight of each specimens from Laiinsoo River (n=127; F=36, M=91) was measured to the nearest millimeter and 0.01 gr respectively, and also, stomachs were opened (n=137) and their contents were analyzed. The abundance of food items in the digestive tracts was determined by counting the food items. Food selectivity was measured by the Ivelev index (Ivelev, 1961) with the following formula: $E_i = (p_i - q_i) / (p_i + q_i)$, where p_i = fraction of an ith

category of prey, q_i = fraction of an ith category of prey in the benthic community.

Table 1- Some characters of Laiinsoo River.

some characters	Laiinsoo River
depth (m)	0.25
wide (m)	8
Water velocity (m/s)	1.6
Water temperature ($^{\circ}$ C)	9
Air temperature ($^{\circ}$ C)	7
Water discharge (m^3/s)	1.623
elevation	800

The relation of weight to length was calculated applying the exponential regression equation, $W = aL^b$, where W is the total weight in gram, L the total length in centimeter, a and b are the parameters to be estimated (Ricker, 1975). Some characters of this river are showed in Table 1.

Results and Discussion

The length frequency was determined for both sexes (Figure 4). In Laiinsoo River total weight varied from 1 to 146.5 g for males and 1.7 to 428 g for females and total length varied from 44 to 233 mm and 55 to 340 mm for males and females, respectively. The average total length for females was more than for males. The range of total length and weight was estimated. The ratio of male to female was estimated as 2.5:1 from Laiinsoo River (n=127). In Laiinsoo River, Length-weight relationship calculated for 30 specimens by using the length and weight were found as $\ln \text{ weight} = -10.594 + 2.796 \ln \text{ length}$ and $\ln \text{ weight} = -12.108 + 3.134 \ln \text{ length}$ for males and females, respectively. The slopes (b values) of the length-weight regression were not significantly different between sexes (ANCOVA, $p < 0.001$) Figure 3.

During the study, the stomachs of 137 *S.pelzami* in Laiinsoo River were examined. The published data on diet and growth of *S.pelzami* is somewhat limited. The diet of *S.pelzami* consists almost of benthic invertebrate that belong to 11 different taxonomic groups (Figure 1). We conclude that chironomidae and Simuliidae represent an important part of food intake

and are an important factor growth (Figure 5). A total of 990 aquatic insects were analysed in the stomachs. The diet of this species is shown in Figure 2. Of the 137 fish studied in Laiinsoo River, 40 (29.19%) had empty guts. In terms of their frequency of occurrence and overall weight contribution, chironomid (pupa) and Simuliidae (larva) dominated the diet.

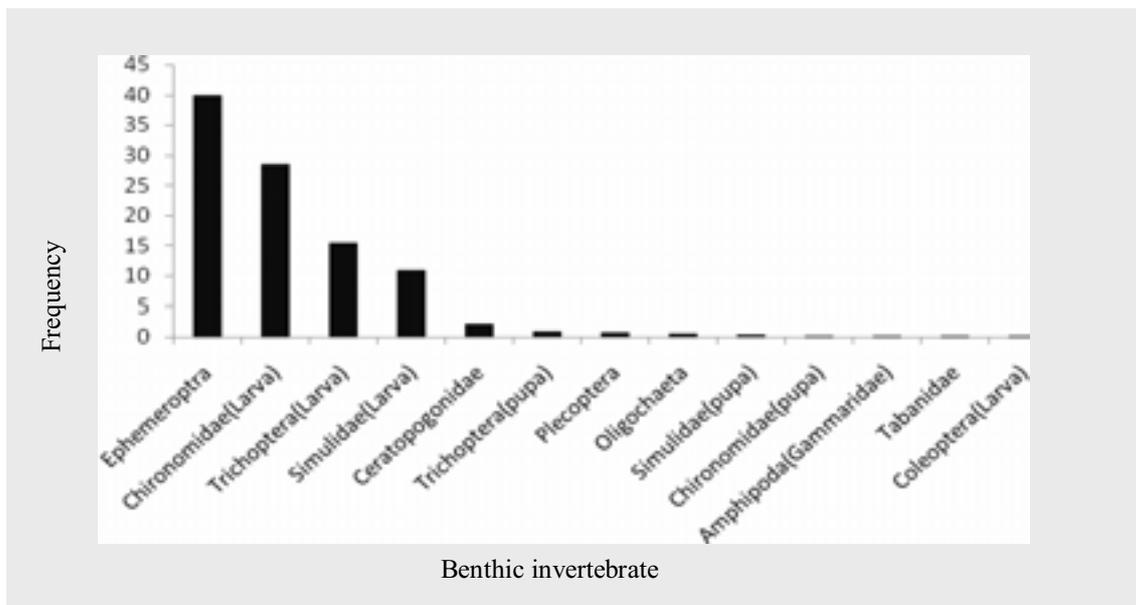


Figure 1- Frequency of benthic invertebrate in Laiinsoo River.

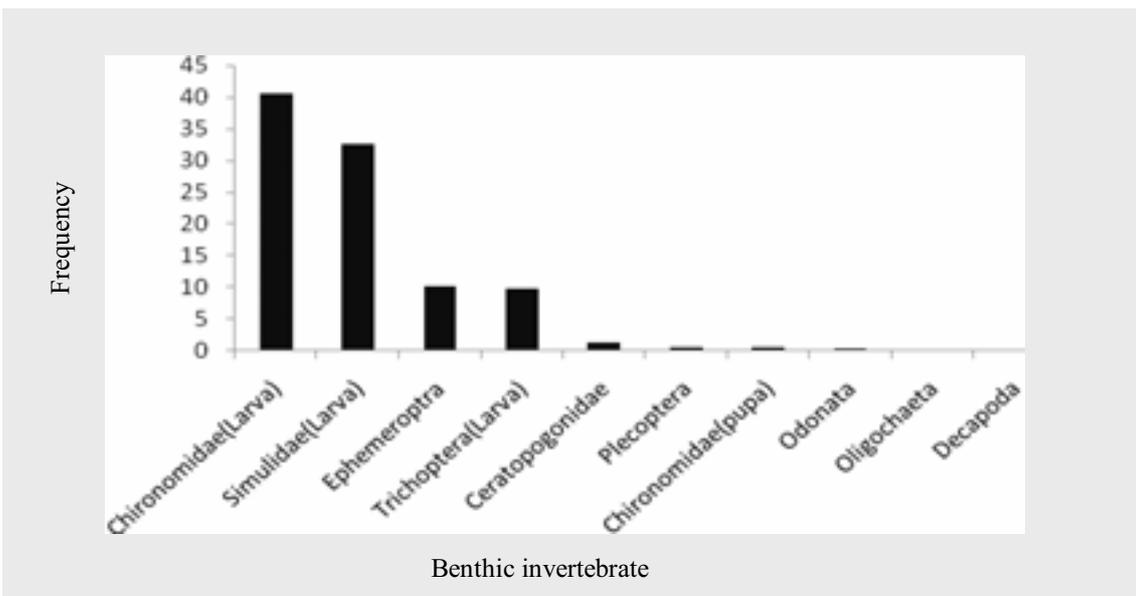


Figure 2- Frequency of benthic invertebrate in the diet of *S.pelzami* in Laiinsoo River. Number of stomach analysed= 137.

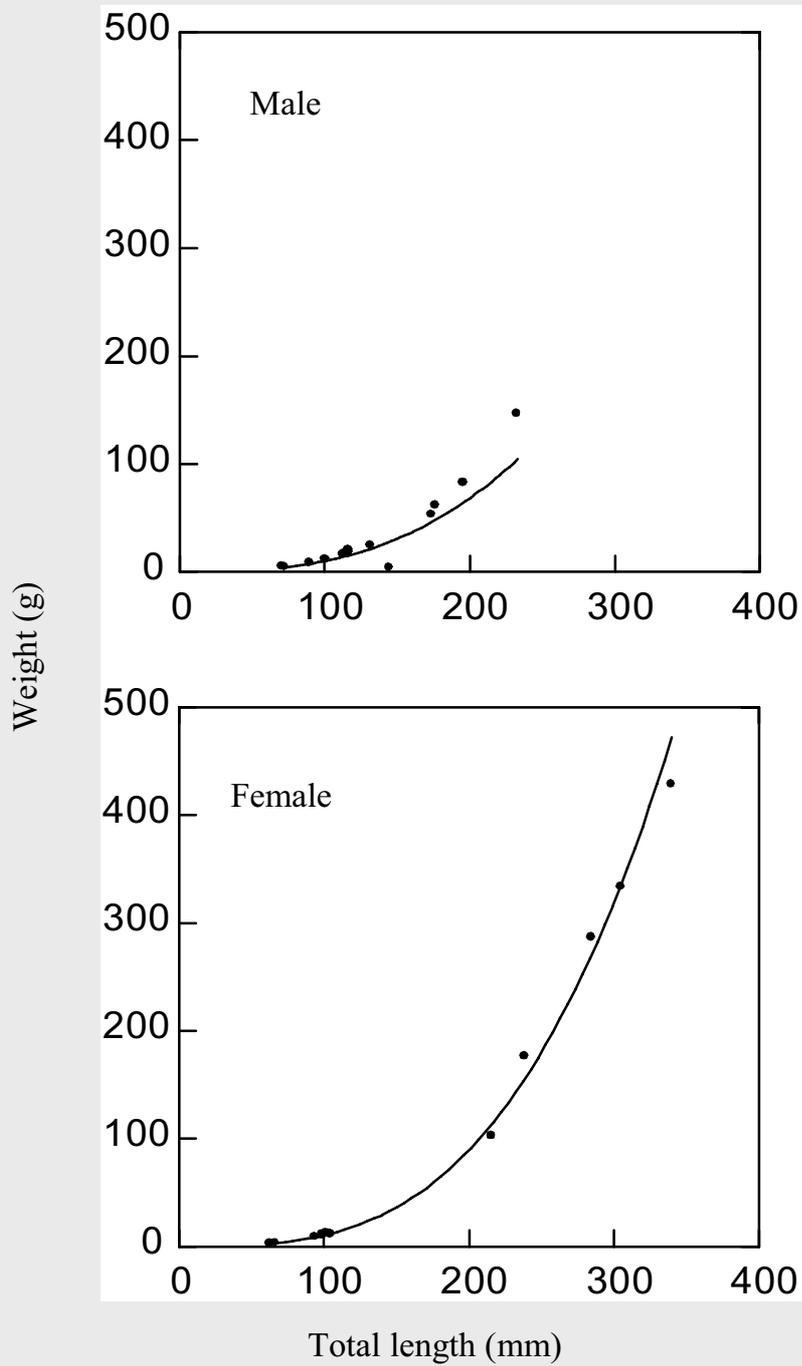


Figure 3- Total length- weight relationships of *S.pelzami* from Laiinsoo River.

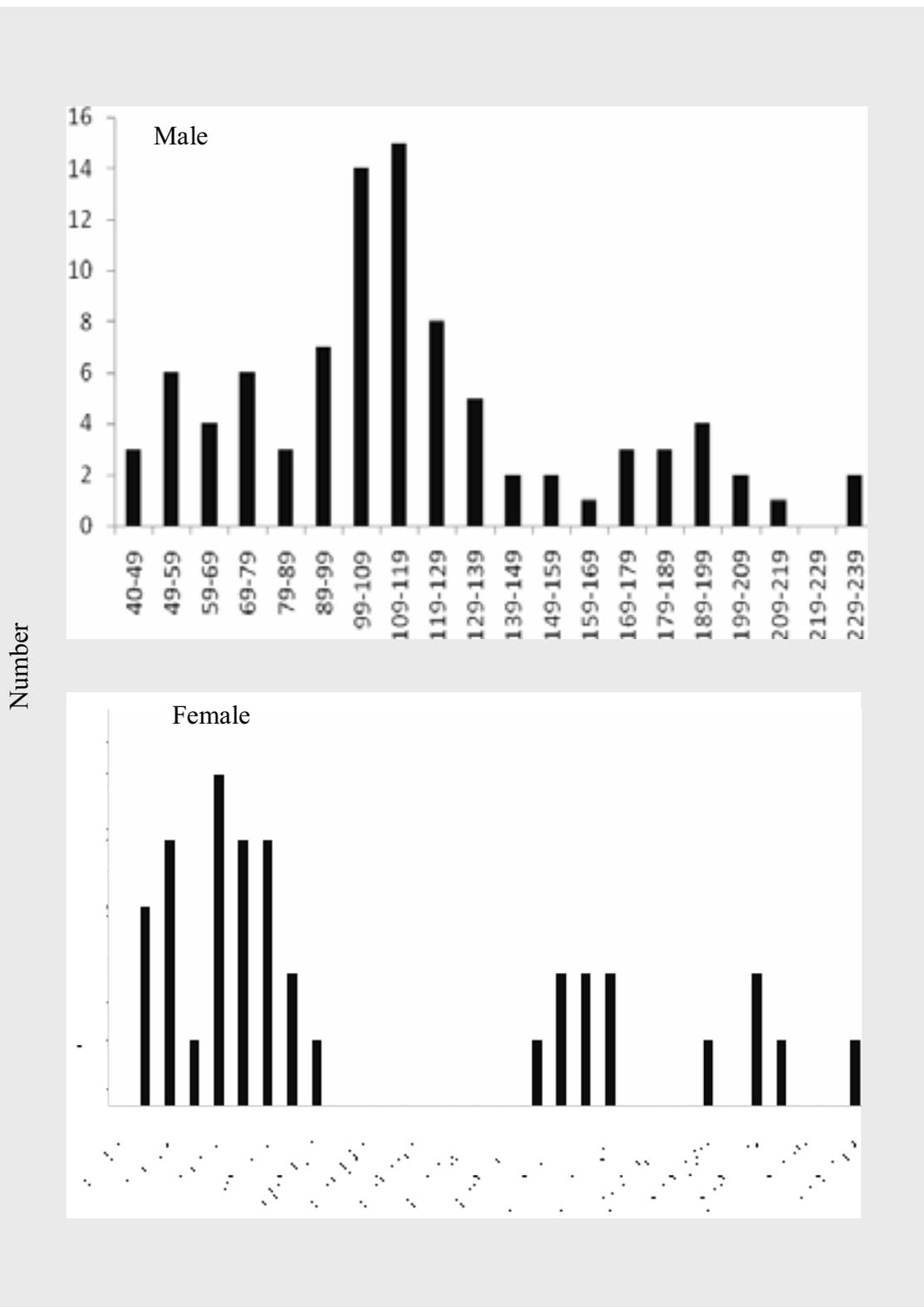


Figure 4- The frequency of total length of *S. pelzami* in Lainsoo River.

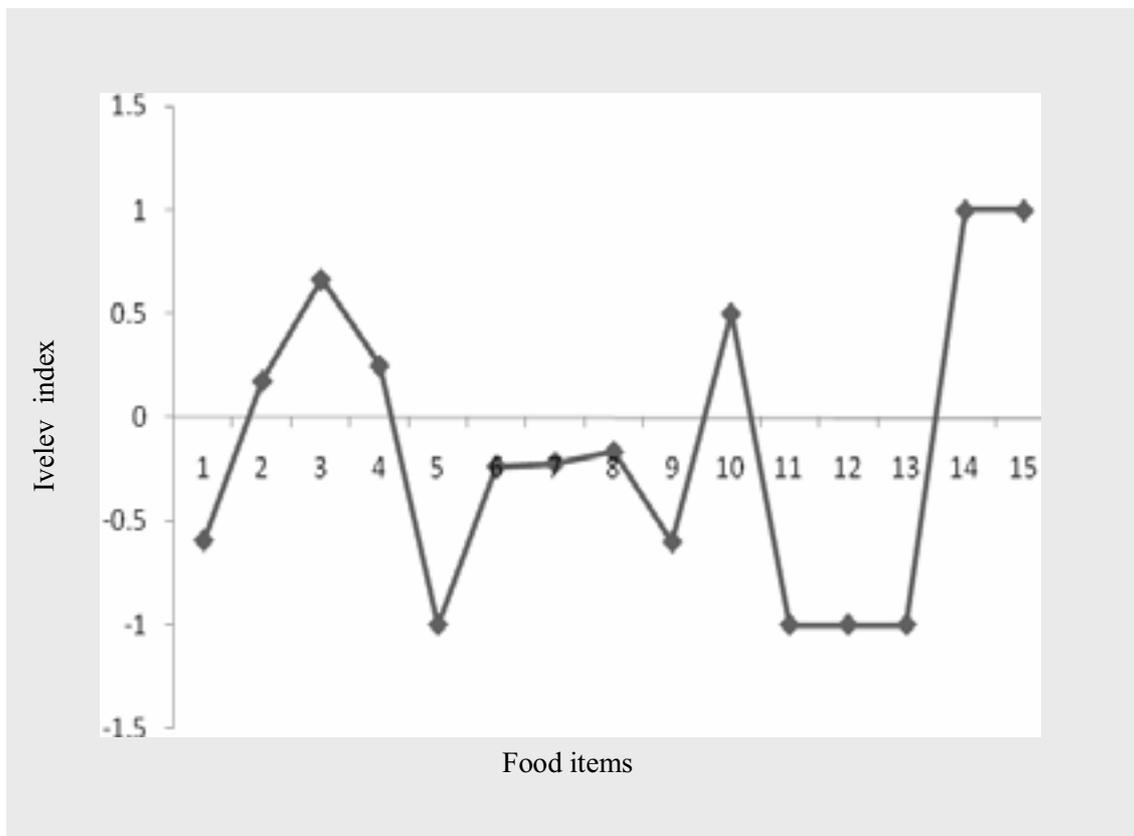


Figure 5. Iveyev index of food selectivity for *S. pelzami* in Lainsoo Rivar.

1= Ephemeroptera; 2= Chironomidae(Larva); 3= Chironomidae(pupa); 4= Trichoptera(pupa); 5= Simuliidae(pupa); 6= Ceratopogonidae; 7= Tricoptra; 8= plecoptra; 9= Oligochaeta; 10= Simuliidae(Larva); 11= Amphipoda; 12= Tabanidae; 13= Coleoptra(Larva); 14= Odonata; 15= Decapoda

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