



## **Effect of freezing and some preservatives on morphometric characters of *Barbus luteus* (Pisces: Cyprinidae) collected from Qurna Marshes, South of Iraq**

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### **Abstract**

A total of thirty specimens of *Barbus luteus* (Heckel, 1843) from Qurna Marshes north of Basrah in November 2008 were collected. Seven morphometric characters (total length, standard length, body depth, head length, body width, snout length and eye diameter) of specimens were measured to determine the effect of freezing and preservation during the study period (11 week). The different preservatives were prepared as follows: 10% formalin, 70% alcohol and freezing experiment. The results showed three types of effects on morphometric characters: Shrinkage, increase and no effect, the greatest shrinkage was noticed in body depth of specimens which preserved in 10% formalin, the greatest increase was in head length of specimens which preserved in freezing and no effect was noticed in snout length and eye diameter which preserved in 10% formalin and total length which preserved in freezing.

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**Key words:** Preservation, morphometric characters, *Barbus luteus*, south of Iraq *laria*

### **1- Introduction**

Ichthyologists used various preservation techniques and methods to preserve fish specimens at different stages. Formalin, alcohol and freezing are most commonly used (Billy, 1982).

The himri, *Barbus luteus* (Heckel,

1843), is an endemic fish in mesopotamian rivers. Beckman(1962) reported its presence in the Orontes river in Syria. It is also Known as *Carasobarbus luteus* according to Karaman (1971) from the Euphrates river in Turkey. In local catchments, the himri can form a high

proportion. This fish is of high value as food (Al-Hazzaa, 2005).

Jawad *et al.* (2001) and Jawad(2003) reported that the Individuals of *Tilapia zilli* and *Alepes djeddaba* showed some variation in their morphological characters when they were kept in different preservatives and freezing. The aim of the work is to examine the effect of formalin, alcohol and freezing on some morphometric characters of *Barbus luteus*.

## 2-Materials and Methods

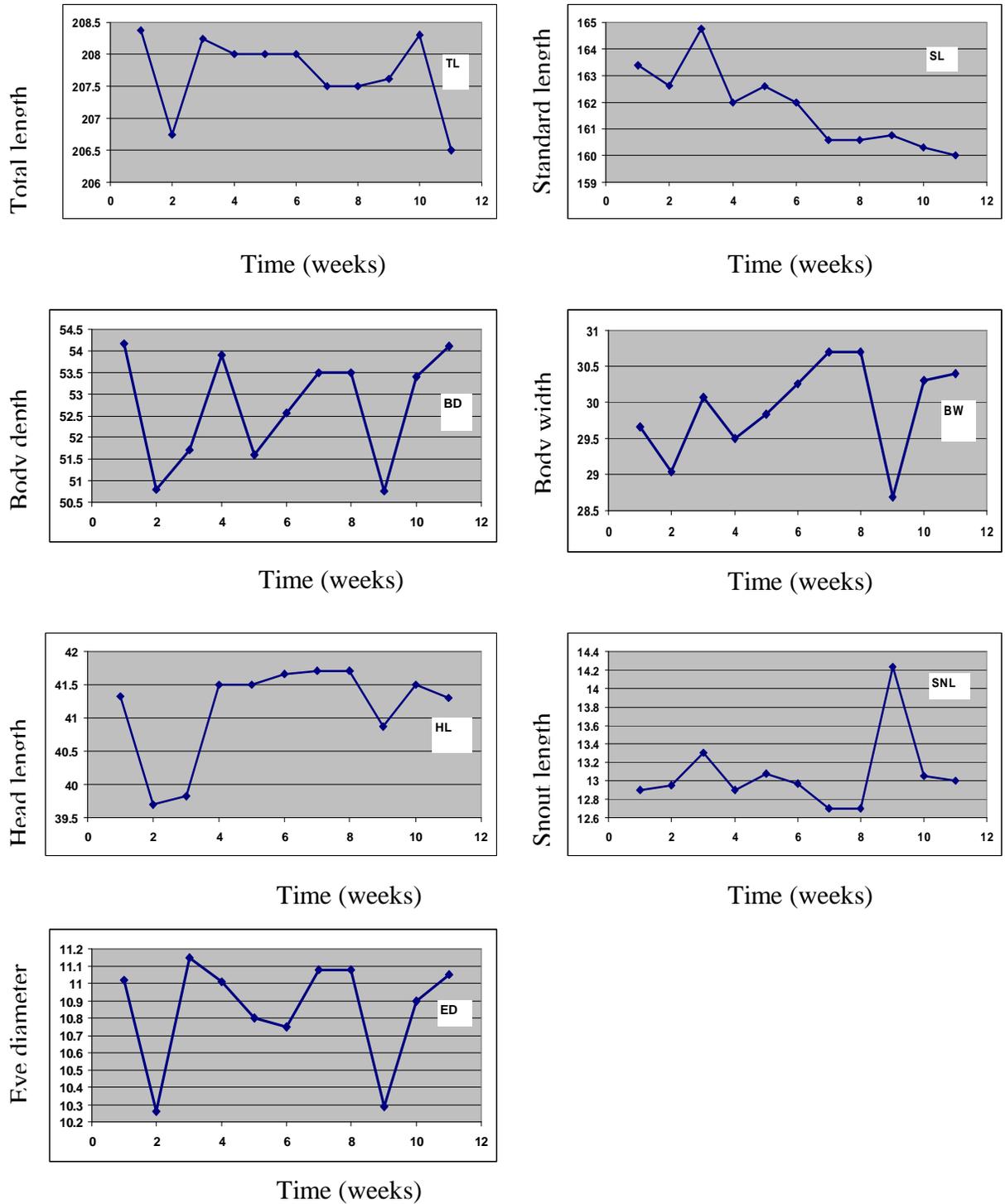
A total of thirty specimens of *Barbus luteus* were collected from Qurna Marshes north of Basrah in November 2008. Fish of equal size as possible were chosen to obviate size and age effect (standard length 137-195mm). Seven morphological characters: total length (TL), standard length (SL), body depth (BD), head length (HL), body width (BW), snout length (SnL) and eye diameter (ED) of specimens were measured. Specimens were divided into three batches (10 fish for each batch) to be used for 10% formalin, 70% alcohol and freezing experiments during 11week.

## 3-Results

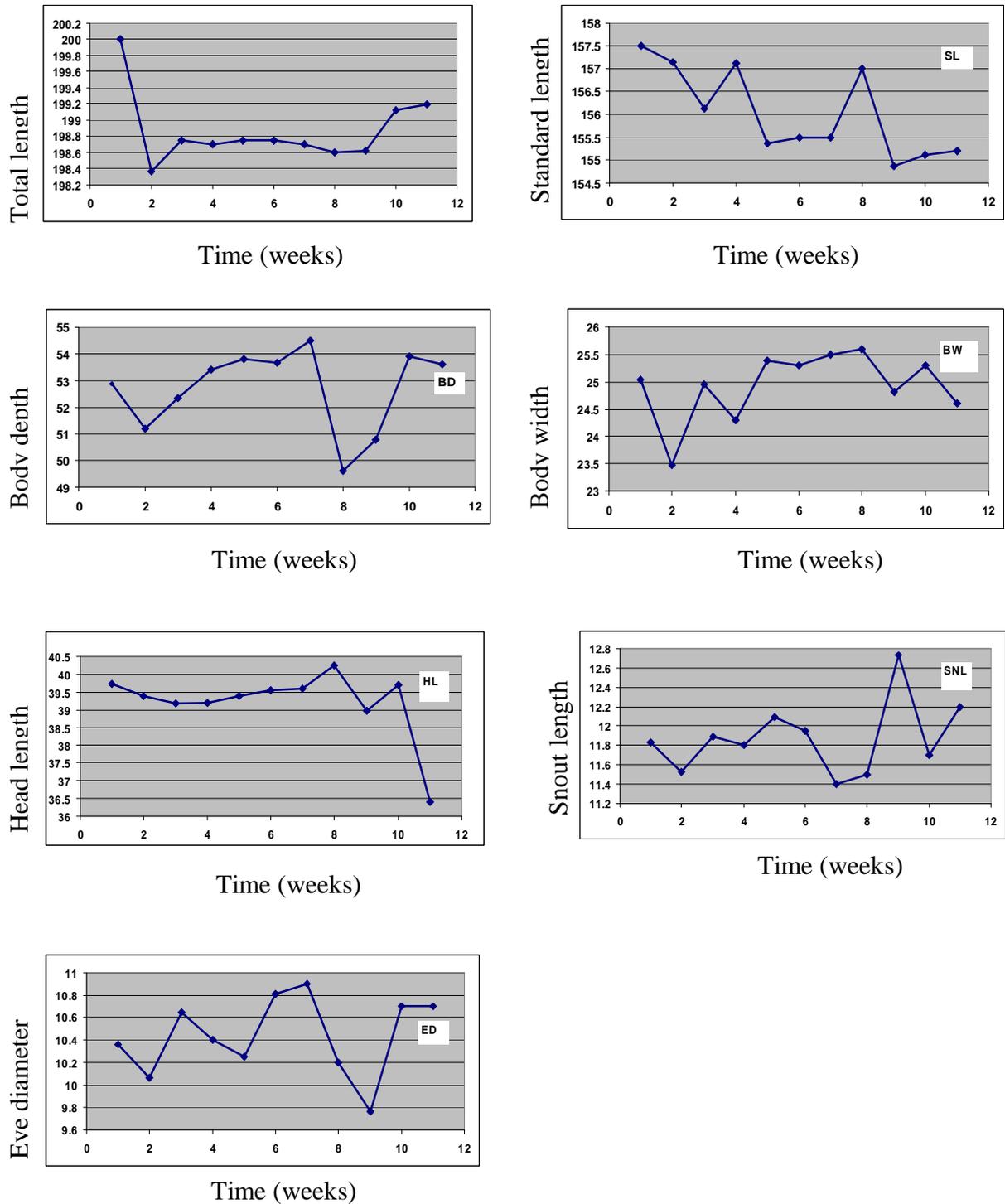
The figures (1,2,3) were showed different degrees of effects on

morphometric characters of *B. luteus* which were preserved in formalin, alcohol and freezing during (11 week), as to preservative with 10% formalin was a shrinkage in (TL, SL, BD, HL), and there was an increase in (BW) but no effect in (SnL,ED), while in 70% alcohol a shrinkage showed in (TL, SL, BW, HL, ED) and a increase in (BD, SnL). By freezing ther was shrinkage in (SL, BD) and an increase in (BW, HL, SnL, ED) but no effect in (TL).

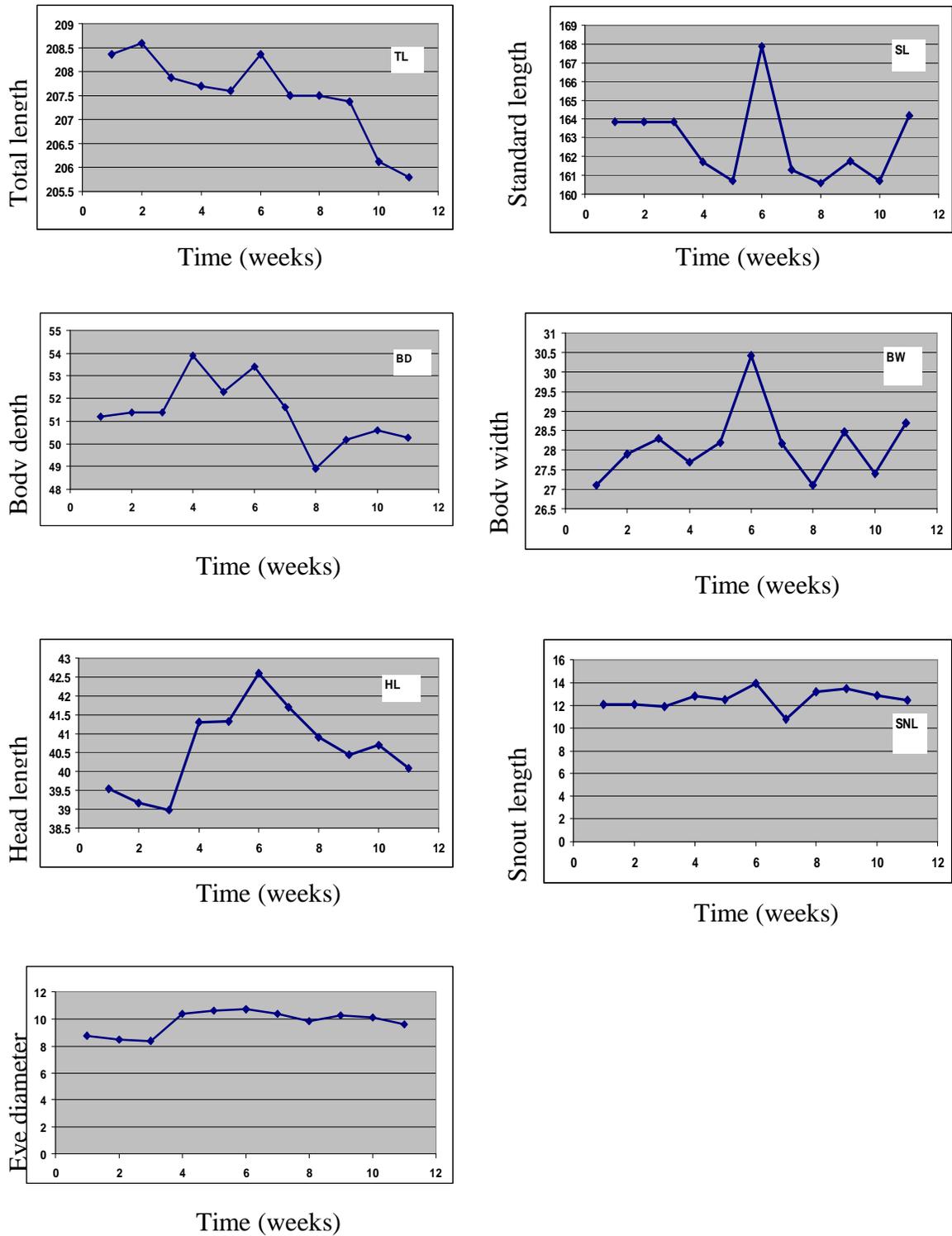
Tabel (1) is supported the result, showed three types of effect: Shrinkage, increase and no effect. The greatest shrinkage was noticed in specimens which preserved in 10% formalin (BD: 3.46%), alcohol (SL: 2.6%) and freezing (BD: 2.3%), the less shrinkage was noticed in specimens which preserved in 70% alcohol (BW: 0.34%) while the greatest increase was in specimens preserved in formalin (BW: 1.04%), alcohol (SnL: 1%) and freezing (HL: 2.1%) and The less increase was in specimens that were preserved in formalin (BW: 1.04%), alcohol (BD: 0.9%) and freezing (SnL: 1.11%) but no effect was observed in formalin (SnL, ED) and in freezing (TL).



**Fig(1) Morphometric characters of *Barbus luteus* which exposed to 10% formalin for 11 weeks.**



**Fig(2) Morphometric characters of *Barbus luteus* which exposed to 70% alcohol for 11 weeks.**



**Fig(3) Morphometric characters of *Barbus luteus* which exposed to freezing for 11 weeks.**

Table (1) Effect of different preservative methods and freezing on morphometric characters. (TL: Total length), (SL: Standard length), (BD: body depth), (BW: Body width), (H.L: Head length), (SnL: snout length), ED: Eye diameter). After exposure for 11 weeks.

Morphometric characters	Preservation	Effect	%
TL	Formalin 10%	Shrinkage	1.62
SL	Formalin 10%	Shrinkage	3.37
BD	Formalin 10%	Shrinkage	3.46
BW	Formalin 10%	Increase	1.04
HL	Formalin 10%	Shrinkage	1.49
SnL	Formalin 10%	No effect	0
ED	Formalin 10%	No effect	0
TL	Alcohol 70%	Shrinkage	1.25
SL	Alcohol 70%	Shrinkage	2.6
BD	Alcohol 70%	Increase	0.9
BW	Alcohol 70%	Shrinkage	0.34
HL	Alcohol 70%	Shrinkage	1
SnL	Alcohol 70%	Increase	1
ED	Alcohol 70%	Shrinkage	1
TL	Freezing	No effect	0
SL	Freezing	Shrinkage	2.17
BD	Freezing	Shrinkage	2.3
Bw	Freezing	Increase	1.37
HL	Freezing	Increase	2.1
SnL	Freezing	Increase	1.11
ED	Freezing	Increase	1.38

#### 4- Discussion

Body proportions of preserved fish were showed variable degrees of change after a limiting period of preservation in various preservatives. The results are in accordance with those of Al-Hassan and Abdullah (1992) for *B. leutus*, in which they reported changes in the fish body proportions due to preservatives. Most authors have reported decrease in length (Engel, 1974; Sayers, 1987) but Billy (1982) reported a slight increase in length or at least no shrinkage in preserved specimens of *Sarotherodon mosambicus*.

Freezing has defects, the period during which the fish remains fresh is limited and it is not possible to stop the post mortem autodegradation of fish muscle which leads to reduced freshness. The period of freshness-preserving needed for these fishes can be considered as 10 days or some what longer (Kato *et al.*, 1974).

The effect of different preservatives on the morphology of fishes in relation to size has been the subject of several papers, Smith and Walker (2003) showed that changes in the length and weight of 240 larva and juveniles carp (standard length 10-45mm) were monitored over 180 days after preservation in 70% and 95% ethanol, they showed shrinkage varied with initial (pre-preservation) size and ethanol concentration but was stable after 1day,

shrinkage was directly proportional to initial body size but percent shrinkage peaked.

Jawad (2003) notes that individuals of *Alepes djeddaba* showed some variation in their morphological characters when they kept in different preservative and freezing, shrinkage was the rule in the preservation test, increase showed in the morphological characters was also evident. The much longer period of freezing and different concentrations of formalin and alcohol may caused some mistakes in measurements of morphometric characters which use in taxonomic studies of fishes.

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تأثير التجميد وبعض مواد الحفظ على الصفات المظهرية لأسماك الحمري *Barbus luteus*  
(Heckel, 1843) المصادرة من أهوار القرنة, جنوب العراق

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الخلاصة

جمعت 30 عينة من أسماك الحمري *Barbus luteus* من أهوار القرنة جنوب العراق خلال شهر تشرين الثاني 2008 تم قياس سبع صفات مظهرية (الطول الكلي والطول القياسي وعمق الجسم وعرض الجسم و طول الرأس وطول الخطم وقطر العين) لمعرفة تأثير التجميد والحفظ خلال فترة الدراسة التي امتدت إلى 11 أسبوع. قسمت الأسماك إلى ثلاث مجاميع عرضت المجموعة الأولى إلى الفورمالين 10% والمجموعة الثانية إلى الكحول نسبة 70% والثالثة إلى التجميد. أظهرت النتائج ثلاث من التأثيرات على الصفات المظهرية وهي الانكماش والتمدد وعدم وجود تأثير, أكبر قيم الانكماش لوحظت في صفة عمق الجسم للنماذج المحفوظة في الفورمالين 10% واكبر قيم التمدد كانت في صفة طول الرأس للنماذج المحفوظة بالتجميد في حين لم يلاحظ تأثير في صفتي طول الخطم وقطر العين للنماذج المحفوظة في الفورمالين وفي صفة الطول الكلي للنماذج المحفوظة في التجميد.

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