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زیست‌شناسی
دریای خزر

از شماره ۱ تا ۴۹

دوره سوم

شماره اول

مرکز مدارک علمی
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مقدمه

نظر به علاقه ی گروهی از زیست شناسان ایران به تحقیق در زمینه زیست شناسی دریای خزر ـ مرکز مدارك علمی موسسه تحقیقات و برنامه ریزی علمی و آموزشی تصمیم گرفت فهرستی شامل چکیده کلیه ی مقالات، کتابها و گزارشاتی که تاکنون درباره مسائل زیست شناسی دریای خزر منتشر شده است تهیه نماید.

راهنمای استفاده از چکیده

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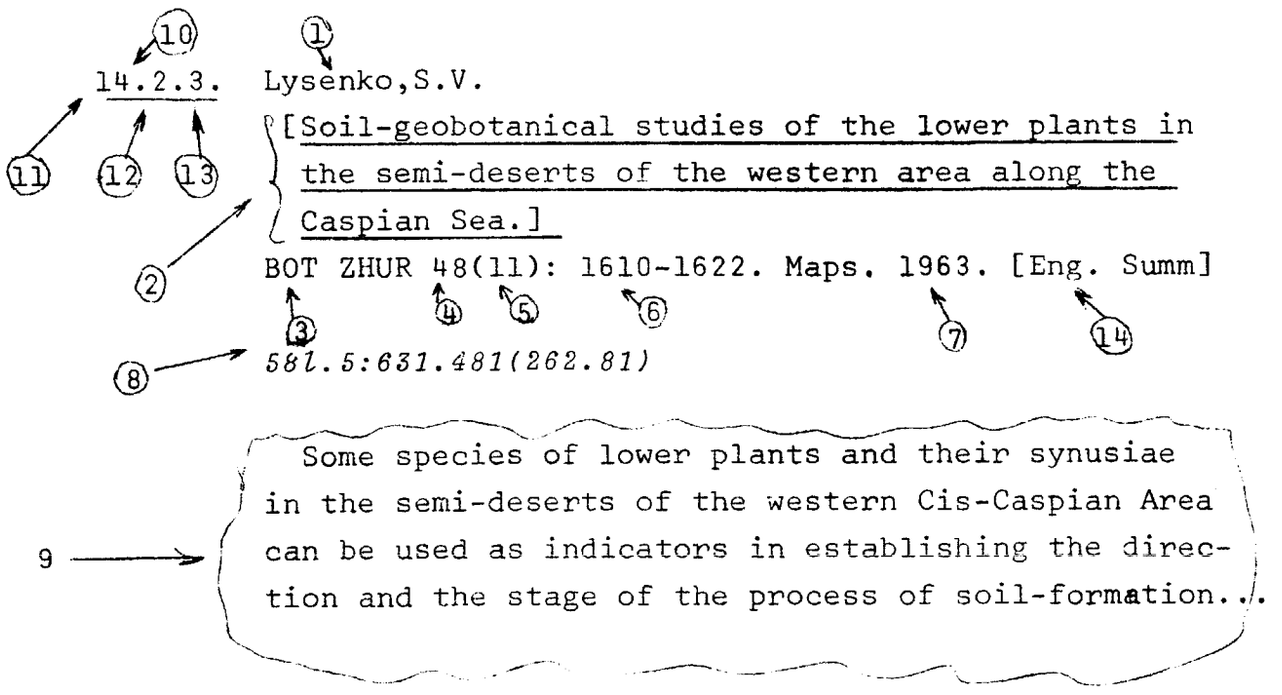

۱ــ نام و نام های مولف

۲ــ عنوان مقاله

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۱۳ــ شماره ترتیب چکیده

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تبصره : در مورد اختصارات از روش Biological Abstracts استفاده شده است.

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I N T R O D U C T I O N

Growing interest of Iranian biologists to engage in research on the biology of the Caspian Sea has prompted the Iranian Documentation Centre of the Institute for Research and Planning in Science and Education to compile a bibliography containing absracts of articles, books, and reports published to date on the biology of the Caspian Sea.

Guide for use of Abstracts

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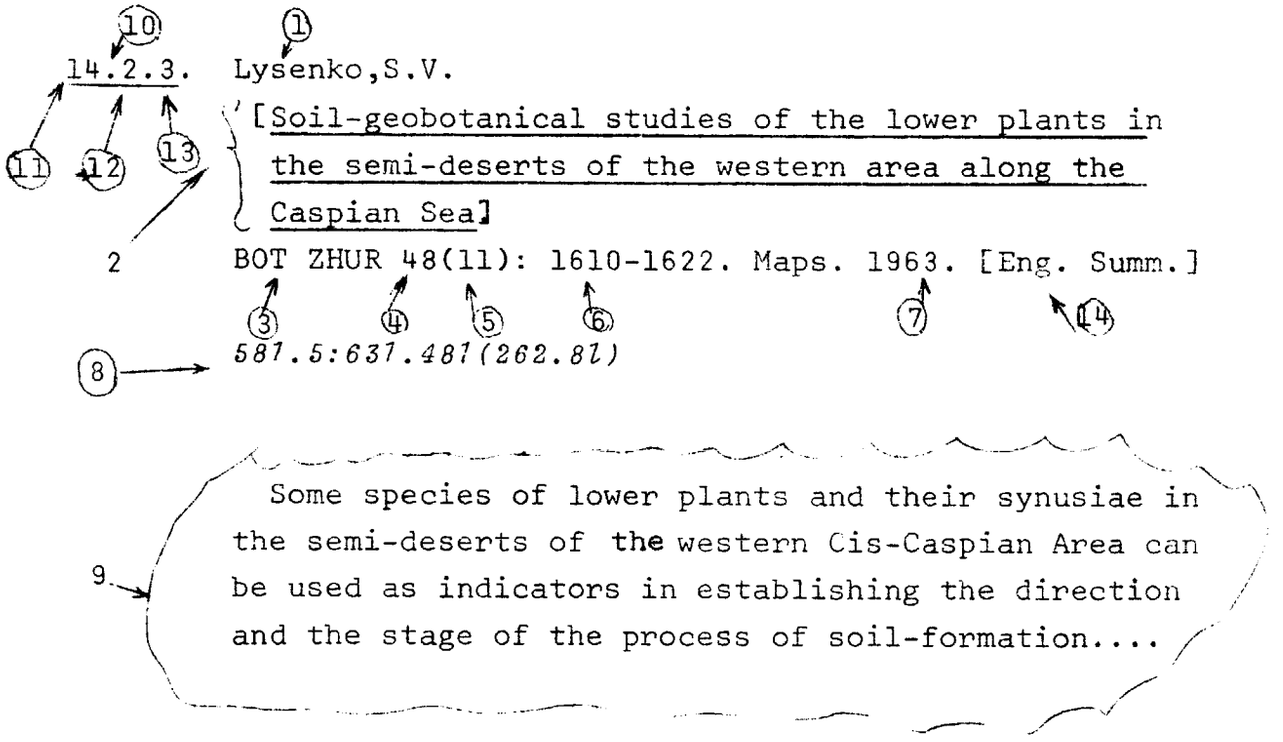

A. The articles include the following information:

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10. Code number
11. Special issue of the Bibliography of the Caspian Sea)
12. Volume number
13. Article number
14. [Eng.Sum.] shows that the article has a summary in English, (translation) shows that the summary has been translated into English from another language.

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OCEANOGRAPHY-SUBMARINE TOPOGRAPHY

551.46

14.3.1 Fedosov, M.V.

[The chemical basis of the nutritional value of southern seas and the character of their water.]

Inform. S.Vses. Nauchn. Issled. Inst. Morsk. Rybn. Khoz. I Okeanog. 1.14-19. 1957; Referat. Zhur. Biol., 1959, No. 37967. (Translation)

551.464 :613.2(262.81)

The author discusses the role of river discharge in the balance of the southern seas in the SSSR, the increased utilization of dry-land biogenic substances flowing into the shallow seas as compared with those in deep seas, and the necessity of the means for improving the water regime with a view to optimum utilization of river discharges into the Caspian, Azov, and Aral seas.-- Courtesy NSF (PL 83-480) 1963.

66.47.5576

SYSTEMATIC PALAEOZOOLOGY. CRUSTACEAE
565.3

14.3.2. Shornikov, E.I.

[Finding of a representative of the genus Candona (Crustacea, Ostracoda) belonging to the group of fossil species Candona lobata (Zalanyi) in the Recent state in the Caspian Sea.]

Zool Zh 45(7): 1094-1096. Illus. 1966. [Engl. summ.]

565.33(262.81)

A new species, Candona camelus Schornikov that is very close to the species known from the Pleistocene and Postpleistocene deposits of brackish water bodies-derivatives of the Thetys Sea is found in the Caspian Sea. These fossil species are assigned to the genus Caspiolla Mandelstam, 1960. The limb structure shows that this species belongs to the genus Candona Baird. This gives grounds to unite the genus Caspiolla into the synonym Candona, assigning the species belonging to this genus to the group Candona lobata distinguished by Pocorny. It is likely that the presence of a long apical claw and a long bristle on the ventral margin of the last but one joint of the walking leg is correlated to the pointedness of the hind-ventral angle of the shell reached by the end of this

limb at rest. The peculiar shape of the shell similar to that in the representatives of marine genera in the C lobata group might have been developed in relation to the adaptation to the dwelling in large waterbodies-seas, on the silt at considerable depths.

67.48.77668

14.3.3 Zevina, G.B.

[New organisms in the Caspian Sea.]
Priroda 7.79-80. 1959; Referat. Zhur. Biol., 1960, No. 98338. (Translation)

576.75(262.81)

After the opening of the Volga-Don Canal a series of organisms migrated from the Black and Azov Seas into the Caspian Sea in the bilges of ships. Several species of algae were found which were hitherto unknown in the Caspian Sea. Some of them probably settled only recently. Among animals which have thus appeared are the crab, Rhithropanopeus harrisi and a bryozoan Electra crustulenta. They were first found in the Caspian Sea in 1958. It can be expected that some other organisms and wood borers carried on the ship's sides will migrate into the Caspian Sea. --Courtesy NSF (PL 83-480) 1963.

66.47.55601

14.3.4 Bogdanova, V.M.

[Microflora distribution in the rocks and waters of tertiary deposits of the nothern part of the Caspian

Lowland (the Furmanov area).]
Mikrobiologiya 34(2), 361-365. 1965. [Engl. summ.]

576.851(262.81)

Hydrocarbon oxidizing bacteria-indicators of oil gases were detected in water and rock samples taken from the bores disclosing tertiary deposits in the northern part of the Caspian depression. Distribution of gas producing bacteria (CH_4,H_2,H_2S,N_2) is not uniform throughout the area and thickness of tertiary deposits. The lithology of the rocks is not connected with the distribution of hydrocarbon oxidizing and gas producing bacteria. The presence of methane, H,H_2S and N-producing bacteria in samples of the structure bore No. 160[2] suggests that processes of modern gas formation take place in this region which may affect the formation of gas accumulations. Lack of methane-producing bacteria in other water and rock samples studied indicates that gas occurrence in tertiary deposits of the northern part of the Caspian lowland is mostly due to methane migration from deeper layers.

66.47.103157

579 NATURAL HISTORY COLLECTIONS

14.3.5 Berdicheskii, L.S.
[Biological Principles for regulating fishing in the north Caspian Sea.]
[English summ.] Zool Zhur 38(1): 88-102. 1959. Referat.

Zhur., Biol., 1959 , No. 88808. (Translation).

579:639.2(262.81)

The discontinuation of zander, bream, and acipenserid fishing in the North Caspian Sea, the modification of fishing devices, and the establishment of new fishing sizes will promote the renewal of the reserves of the commercial fish. --Courtesy NSF(PL 83-480) 1963.

66.47.5613

14.3.6 Levina, F.Ya.

[The vegetation of the semi-desert of the Northern area of the Caspian Sea and its food value.]

336p. Illus. Nauka: Moscow-Leningrad. 1964.pr. 2 rubles 32 kopecks. From: Ref Zh Biol, 1965, No. 2V228K.

66.47.59140

58(262.81)

581 GENERAL BOTANY

14.3.7 Khlebnikova, N.A.

[Transpiration and photosynthesis of free-and shrub plants in the Caspian Lowland.]

Tr. Inst. Lesa Akad. Nauk SSSR 38: 140-160. 1958; Referat. Zhur., Biol., 1959, No. 57275. (Translation)

581.132(262.81)

In the Caspian lowland the intensity of transpiration of the tree species (Chinese elm, [Ulmus parvifolial, green ash [**Fraxinus viridos**], Russian olive, [Elaeagnus

angustifolia] and boxelder [Acer negundo]) diminished during the season. In the sun, the intensity of transpiration was lower than in the hollow. Particularly low intensity values of transpiration were obtained in a dry year. Trees in the sun and those in the hollow were compared to the number of hours during which stomata remained open. More than one half of the moisture lost in transpiration of one tree went to the illuminated leaves. The intensity of photosynthesis was highest on dark-colored soils in the hollow in illuminated leaves. Maximum photosynthesis in illuminated trees was observed in the morning hours, whereas in shaded leaves it was observed at noon or in the afternoon. Optimal values of physiological radiation (determined by graduated photometer according to L.A. Ivanov method) for the photosynthesis of illuminated leaves of the Chinese elm in the hollow was 0.378 g-cal/cm^2/minute, whereas in the sun it was 0.176 g-cal for boxelder and green ash in the hollow these values were 0.293 and 0.227 g-cal, respectively. In shaded leaves values of the optimum physiological radiation were lower than in illuminated leaves. The amount of water evaporated/gram of assimilated CO_2 (transpirational assimilation quotient) was lowest in July during drought and dry winds (because of a greater stability of photosynthesis in comparison with transpiration); it was highest in Sept. For the increment of dry matter of the aereal mass, 16-36% of assimilated C' were; the remainder was used for respiration. --Courtesy NSF (PL 83-480) 1963

14.3.8 V'Yushkova, V.P.

[Attempt to determine the decrease of Adacna vitrea and Monodacna edentula under northern Caspian conditions.]

Gidrobiol zh 2(1): 58-62. 1966.

581.526.323.3(262.81)

67.48.58052

14.3. 9 Makarova, I.V.

[A new species of Chaetoceras from the Caspian Sea plankton.]

[In Russian and Latin] Bot. Materialy Otd. Sporovykh Rast. Bot. Inst. Akad. Nauk SSSR 12: 86-88. 1959; Referat, Zhur., Biol., 1960, No. 38876. (Translation).

581.526.325.3(262.81)

A description is given of Chaetoceras mirabilis from the central Caspian.-- Courtesy NSF(PL 83-480) 1963.

66.47.13828

14.3.10 Anonymous.

[Information on the flora and vegetation of the northern Caspian Sea area.]

218p. Illus. Akad. Nauk SSSR. Geogr. Obshch. SSR Zapadn. Kazakhstanskii Otd.: Leningrad. 1964. Pr. 55 kopecks. From: Ref Zh Biol, 1964, No. 21V2K.

581.9(262.81)

66.47.44251

14.3.11 Makarova, I.V.; Proshkina-Lavrenko, A.I.
[New diatomaceous algae in the plankton of the Caspian Sea.]
In: Novosti Sistematiki nizshikh rastenii, 1964. [New on the taxonomy of lower plants, 1964.] Nauka: Moscow-Leningrad. 34-43. 1964. From : Ref Zh Biol, 1965, No 5D185.(Translation)
582.26:581.526.325(262.81)

Seven new taxa are described: Podosira Parvula; Scelectonoma cylindraceum; Cyclotella caspia Grun. var. affinis; Stephanodiscus socialis; Thalassiosira hustedtii Poretzky et Anissimova var. vana; Chaetoceros turbineus. Temperature and salinities of their biotopes are given.
66.47.109169

14.3.12 Makarova, I.V.
[Characteristic features of the diatom flora of the Black Sea, the Azov Sea and the Caspian Sea plankton.]
Bot Zh 50(4): 498-502. Illus. 1965. [Engl. summ.]
582.261:581.526.325.3(262.81)

The investigation of the systematic composition of the diatoms in the phytoplankton of the Black Sea, the Azov Sea and the Caspian Sea and its comparison with that of the Adriatic Sea affords the evidence of the impoverishment of the species composition of the plankton diatoms of marine origin progressing from the Adriatic to the Caspian Sea. The Black Sea has 29% of spp. in common with the Adriatic Sea, while the Azov Sea and the Caspian Sea have 20%, and 10%prespectively.Freshening and isolation of a water-body result not only in the impoverishment of the species composition of the phytoplankton, but also in the disappearance of a number of marine genera of diatoms. Sixteen genera of marine plankton diatoms known in the Adriatic Sea are lacking in the Caspian Sea. A characteristic feature of the Black, Azov, and Caspian seas is the presence of endemic spp. In the Caspian Sea there are 22 endemic spp., while the Black and Azov Seas have 17 endemic spp. each. Besides the endemic spp., the southern seas are also inhabited by some relict spp. persisting since the Neogene; this establishes the affinity of the recent diatom flora with that of the ancient seas of the Late Tertiary.

66.47.118642

14.3.13 Ivanov, V.V.

[Ecology of Flax Weed [Descurainia Sophia] and Lepidium Perfoliatum.]

In: Materialy po Flore i rastitel'nosti Severnogo Prikaspiya. [Information on the Flora and Vegetation Along the

northern area of the Caspian Sea.] Leningrad. 3-32. 1964. From: Ref Zh Biol, 1965, No. 5V108. (Translation).

582.751.4:581.524(262.81)

Not long ago "Mertvyi Kultuk," which had previously been a gulf, dried up as a result of a lowering of the level of the Caspian Sea and gradually became covered with vegetation. In the section which dried earlier than all the others, associations of Eremopyrum triticeum, E. orientale, and Artemisia terrae alba formed. Associations of Halocnemum strobilceum and Senecio nocanus were confined to the sections that most recently became dry. Associations of Descurainia sophia and Lepidium perfoliatum occupy an intermediate position with respect to the length of time they have been in the area. The low degree of species impregnation (8-9 species) of the last 2 associations can be explained, on one hand, by their recent development, and on the other hand by the extreme lack of flora in the adjacent territory. The dominant role of D. Sophia and L. perfoliatum can be caused not only by their salt tolerance, but also by the absence of competition for soil moisture and nitrates by the stronger members of the steppe grass stand: grasses and the non-leguminous forbs accompanying them. Both species have a high degree of seed productivity with good seed germination; however, in dense steppe grass stands this degree of productivity is very sharply reduced. Their seeds are easily and quickly dispersed by wind, rain, and animals. Under-unfavorable conditions these plants change over to ephemeral develop-

ment. There is a bibliography with 96 references.

66.47.80545

14.3.14 Petrenko, A.Z.

[Locality of Trapa natans [Onagraceae] and Salvinia natans in the northern area of the Caspian Sea.]

In: Materialy po flore i rastitel'nosti Severnogo Prikaspiya .[Information on the flora and vegetation of the northern area of the Caspian Sea.] Leningrad. 83-85. 1964. From: Ref Zh Biol, 1965, No. 7V235. (Translation)

582.886(262.81)

Unbroken overgrowths of water chestnut (T.natans) were found in a number of places in the northern area of the Caspian Sea. The reduction of the area of this sp. in this region, which was noted by a number of authors, is connected with irrational economic exploitation, and is not due to its dying out. Salvinia natans, for which there is very little information in the northern Caspian area, was found farther north and farther south of Uralsk at several points. These spp. were not found in the basins of the Uil and Emba Rivers which are farther east. Therefore, it is possible to trace the eastern limit of the distribution of S. natans and T. natans along the Ural River valley, which is also the boundary of European broadleaf flora.

66.47.114192

14.3.15 Zevina, G.B.; Kuznetsova, I.A.
[The role of navigation in changes in the fauna of the Caspian Sea.]
Okeanologiya 5(3): 518-527. Illus. Map. 1965.

591.9:527(262.81)

Water temperature 7-17 C) in 2 x 1 x o-5 m fish tanks covered with a rustproff metallic net of 3 mm mesh. Post-larval pink salmon (75 thousand specimens averaging 210 mg in weight and 35 mm in length) were placed in the tanks on 4 May 1960, and postlarval chum (6307 specimens averaging 510 mg) on 1 June 1960. The young of pink salmon that were transferred to sea tanks grew better there than in fish hatcheries, reaching an average weight of 925 mg by the end of the cultivatinn period (July 30). During the cultivation period from July 30 to Aug. 7 in sea tanks, the weight of chum young maintained on a diet of cooked flounder increased from 510 mg to 2 g. The young were released from the tanks in several batches. The young or pink salmon were fairly active and escaped easily from coalfish that pursued them. By contrast, the young of autumn chum were less active. -- From auth. summ. Transl.

66.47.50641

14.3.16 Ax, Peter.; Jurgen Dorjes.
[Oligochoerus limnophilus new species, a Caspian faunal element, as the first fresh-water paper sentative of the Turbellaria Acoela in the rivers of central Europe.]
INT REV GESAMTEN HYDROBIOL 51(1): 15-44. 1966. [Engl.summ]
591.9(262.81)

The genus Oligochoerus hitherto has been found only in the Caspian Sea. O.limnophilus has been collected in the following rivers of central Europe: upper Elbe, Ilmenau, Lahn, Main, Mosel and Danube. Its habitat is on the under side of stones near the river bank. The structure of the new species is described and illustrated in detail. Eggs were laid in August; the early cleavage stages are similar to those of other acoels. The taxonomy of the genus is discussed and a key is given to the seven known species.
66.47.84629

592/599 SYSTEMATIC ZOOLOGY

14.3.17 Logvinenko,B.M
[The most recent newcomers in the Caspian Sea]
PRIRODA 2.100-101. 1959; Referat. Zhur., Biol., 1960, No. 10797. (Translation)
593.71(262.81)

IN 1956, the hydromedusa Blackfordia virginica Mayer

was found in the Caspian Sea near the mouth of the Kura River. It does not differ from individuals of the Black and Azov seas. It probably penetrated the Volga-DonCanal in the polyp phase while attached to the keel of a ship, or in the ballast cisterns of the ships. Mass development of the medusa can bring about a reduction of useful plankton. The medusa can live in the entire Caspian Sea as it tolerates salinity from 3-18%. -- Courtesy NSF (PL 83-480) 1963.

66.47.20597

14.3.18 Maksimova, L.P.

[Survival and reproduction of Monodacna colorata (Eichw.) v. tanaisiana Mil. in waters of different salinities. (Contribution to the problem of introducing Monodacna into the Caspian Sea and bodies of fresh water).]

In: Ekologiya bespozvonochnykh yuzhnykh morei SSSR. [Invertebrate ecology in southern seas of the USSR.] Nauka: Moscow. 61-79. 1964. From: Ref Zh Biol, 1965, No. 2D155. (Translation)

594:577.9(262.81)

Observations were made on the sexual maturation, breeding time, gonad structure, fertility, spawning, and embryo and larval development of Monodacna from the Gulf of Taganrog. Laboratory experiments showed that Monodacna sperm retained its mobility in fresh water and in water

from the Sea of Azov and the Caspian Sea with salt concentrations of 7-8% and, for a short time, 10%. Development of embryos and larvae occurs normally in waters with salt concentrations of 1-5%. A further increase in salinity results in a decrease in the percentage of developing eggs and, among the developing eggs, in an increase in the number of deformed larvae. Normal development is impossible in freshwater. If the salt concentration does not exceed 7%, adult Monodacna can be taken from water with a 2% salt concentration and placed suddenly in water from the Sea of Azov or the Caspian Sea. With 10% salt concentrations Monodacna survives in water from the Sea of Azov but dies in Caspian water.With a 12.5% salt concentration these mollusks also die in water from the Sea of Azov. When the salt concentrations are changed gradually, Monodacna can survive in water from the Sea of Azov with a 10% salt concentration, and some of the mollusks survive an increase to salt concentrations of 12-19%. Monodacna is better able to withstand high salt concentrations when the temperature is lowered. Under these conditions the survival rate in Caspian water with a 10% salt concentration is also somewhat improved. When the salt concentration of water is decreased below 1% adult Monodacna die suddenly, but some individuals can survive for a long time even in fresh water. The author concludes that it would be possible to introduce Monodacna into the same zone in the Northern Caspian where the salt concentration ranges from 1-5%. This mollusk cannot be introduced into bodies of fresh water.

67.48.26857

13.3.19 Gasyunas,I .I.

[Results of the introduction of food invertebrates of the Caspian complex in Lithuanian bodies of water.]

Zool Zh 44(3): 340-343. 1965. [Engl. summ.]

595.3(262.81)

Lithuanian waterbodies are poor in autochthonous higher crustaceans. In order to enrich the fauna and the food provision of fishes, Crustacea of the Caspian complex (Mesomysis kowaleskyi, Limnomysis benedeni, Pontogammarus crassus, P. robustoides,P.r. aestuarius and Chaetogammarus warpachowskyi were taken from the South Ukraine and acclimatized in the Kaunas water reservoir (the Neman River) in 1960-1961. In 1962-1963 these crustaceans were removed to and acclimatized in the Kurishes Haff, in the vicinity of the bay of the Lake Kroku Lanka of the firth origin.

66.47.65730

14.3.20 Morduchaj-Boltovskoj, F.D.

[New data on the Caspian polyphemids of the Danube and Dneiper Basins.]

VESTNIK CESK SPOLECNOSTI ZOOL 29(?): 197-204. Illus. 1965.

595.324.5(262.81)

14.3.21 Yalynskaya, N.S.

[Pontic-Caspian immigrants from the genus Dikerogammarus (Crustacea, Amphipoda) in the sources of the Dniester River.]

Zool Zh 44(9): 1328-1332. Illus. 1965. [Engl. summ.]

595.371:591.52(262.81)

The paper takes under discussion the material on the disperal and biology of a representative of the Pontic-Caspian fauna, Dikerogammarus villosus bispinosus Mart. This Amphipod is found in the sources of the Dniester. Under new conditions this Amphipod preserves characters of high viability: it is larger than the typical form, its fecundity is high, it has many fat inclusions and is free of parasites. The Amphipod remained oxi-thermophilous. In waterbodies favourable in oxygen and thermal regimes D. villosus bispinosus Mart. has supplanted fresh-water Amphipods of the Balcan group. It should be expected that under favourable conditions the Amphipod described may be found in another water-shed.

66.47.99465

14.3.22 Lyakhov, S. M.

[The Range of Caspian Amphipoda in the Volga River before its hydrotechnical reconstruction.]

Nauchn. Dokl. Vysshei Shkoly. Biol. Nauki 3.16-19. 1958; Referat. Zhur., Biol., 1960, No. 55653. (Translation)

595.371(262.81)(282.247.41)

The range of 9 species of Caspian Amphipoda extended far up the Volga River. The range of 6 species of these (Dikerogammarus haemobaphes, Corophium curvispinum, Pontogammarus sasri, P. abbreviatus, Chaetogammarus ischnus, Stenogammarus macrurus) was reduced considerable after 1920, although the first 2 species are now also numerous in the middle Volga River. The range of Pandorites platycheir inhabiting the lower Volga River did not change. Pont. obesus, occurring in large numbers up to Ulyanovsk, enlarged its range. St. compressus probably also extended its range. The reducation of the range of many Amphipoda species in the Volga River is due not only to subglacial winter suffocation in 1938-1942 but also to increased sewage pollution.--Courtesy NSF (PL 83-480) 1963.

67.48.26765

14.3.23 Epshtein, B.M.

[Bottom fauna and the food of young commercial fishes in the Kura Caspian sea Region.]

Tr Azerb Aidzh Nauch-Issled Rybokhoz Lab 4(1): 99-166. 1964. From: Ref Zh Biol, 1965, No. 3148. (Translation)

597:38(262.81)

Observations on the bottom fauna and food of young fishes in the Kura-Caspian region were carried out both before and after the regulation of the Kura flow (1950 and 1958-69). The fluctuations in water salinity in this region are governed by the volume of the Kura run-off.

In recent years the salinity conditions became more stable. The benthic fauna consists principally of brac kish-water organisms. The greatest diversity in form is exhibited by Crustacea (45 forms). There are also worms and molluscs in this region., By 1958-60 the total biomass of benthos (on the average 32-51 g/m^2) increased 4-fold in comparison with 1950, chiefly on account of molluscs, the main components of the zoobenthos. In the inshore zone there are more gammarids; the biomass here does not exceed 2 g/m^2. With increased depth, the biomass of all benthos components increases, except for gammarids. Throughout the year the highest benthos biomass (80-113 g/m^2) is observed at a depth of 10m. In 1958the following season-to-season variation in biomass was observed: in May the biomass, amounted to 68 g/m^2, in July to 32 g/$m^2$and in Sept. to 48 g/m^2. Data on the feeding of gobies and principal commercial fishes are presented [Cyprinus carpio, roach, Russian sturgeon, sevriuga, "white-eyed bream" (Abramis sapa), bream, zander, "vimba" (Vimba vimba carinata), "shemaia" (Chalcalburnus chalcalburnus chalcoides), barbel, aspl. Analysis showed a high degree of similarity in the food of almost all the species. --From auth. summ. transl.

66.47.50659

14.3.24 Saenkova, A. K.

[The food of the principal benthos-eating fishes of the North Caspian in 1954-1957.]

Tr Vses Nauch-Issled Inst Morskogo Rybn Khoz Okeanogr

54:67-79. 1964. From:Ref Zh Biol, 1965, No. 11I17
(Translation)

597:581.526.323(262.81)

Data are presented on the feeding of roach (1340 specimens), bream (1200), Russian sturgeon (624) and servriuga sturgeon (315 specimens) in the North Caspian in 1954-57. Introduction into the Caspian of new food organisms has led to changes in the feeding behaviour of fishes. In recent years Monodacna has been the main food of roach, Dreissena being in 2nd palce. In 1948 crustaceans (corophiids, gammarids, cumaceans) had a substantial importance in the food of roach; the amount of aquatic vegetation increased from 3 to 9%, which is connected with shallower depths of the roach's spawning places in comparison with previous years (1935). The index of fullness of the intestines of roach increased considerably in recent years (from 78.6% in 1948 to 147.1% in 1957). A characteristic feature of the feeding of bream during the period 1954-57, and particularly during the past 3 years, was the substantial increase in the role of worms. The indices of fullness for bream in 1948-56 were markedly higher than in 1935, but in 1957 they again decreased. Greatest changes have occurred in the diet of Russian sturgeon, which started feeding on Syndesmia for the 1st time in 1956. In 1957 Syndesmia occupied 1st place in the diet of Russian sturgeon. This is explained by the coincidence of the habitat of

Syndesmia with the feeding grounds of the strugeons. In recent years an increase in the number of chironomids was noted in the food of sevriuga.

66.47.85728

14.3.25 Korzhuev, P.A. ; Sharkova, L.B.

[A note on the digestive features of the Caspian sturgeon.]

In: Tezisy dokladov Vsesoyusnogo soveshchaniya po ckologii i fiziologii ryb, 1966. [Report Summaries of the All-Union Conference on the Ecology and Physiology of Fishes, 1966.] Moscow. 65-66. 1966. From Ref Zh Biol 1967, No. 2I106. (Translation)

597.442:591.43(262.81)

The activity of the Caspian sturgeon's intestinal glandular apparatus was reduced during the fish's residence in the river and restored to normal during its migration to the sea. In larvae the formation of the intestines starts with the spiral valve and is followed by the formation of the midgut and stomach. At the same time, secretion begins in the digestive tract. Trypsin appears in larvae up to the time of external feeding and serves apparently for the assimilation of reserve nutritional yolk.

67.48.100372

14.3.26 Amirkhanov, G.A.

[Studies of interspecific features of Caspian sturgeons by means of immuno-serological reactions.]

Tr Molodykh UCH Vses Nauch-Issled Inst Morskogo Rybn Khoz Okeanogr 54-57. 1964. From: Ref Zh Biol, 1965, No. 13I14B. (Translation)

597.442:616-078(262.81)

Immuno-serological differences between mature sevriuga and Russian sturgeon, which spawned on various spawning grounds of the Rivers Kura, Volga, Terek, Sulak, and Samur were investigated by the ring precipitation reaction with whole and absorbed sera, by precipitation in agar according to Ouchterlany's method, and by the complement-fixation test. Marked serological differences were found between various sturgeon stocks confined to definite river basins. The sturgeon stocks of the Kura, Salak, Volga,and Terek exhibited the greatest resemblances.

66.47.100697

14.3.27 Belyaeva, V.N.

[Quantitative estimate of fingerling sturgeons [Acipenseridae] in the Volga delta and the northern Caspian Sea.]

Vop Ikhtiol 5(3): 498-503. Maps. 1965.

66.47.90688

597.442(262.81)

14.3. 28 Belyaeva, V.N.; Matveeva, R.P.

[The food of sturgeon fingerlings in the Volga delta and in the north Caspian Sea.]

Tr Kaspiiskogo Nauch-Issled Inst Morskogo Rybn Khoz Okeanogr 20: 85-91. 1965. From: Ref Zh Biol, 1966, No 2I92. (Translation)

597.442(262.81)

The food composition of sturgeon fingerlings from natural propagation was found to be the same as that of sturgeon fingerlings reared in hatcheries. In the river they used largely gammarids as food (97-98%); on entering the sea they started feeding mainly on mysids (27-74%). The state of nourishment was somewhat higher in fingerlings from natural propagation than in hatchery-reared, tagged fingerlings; their indices of fullness ranged from 195 to 668/000. The feeding intensity of hatchery-reared young was high in both the river and the sea. The young fish started feeding on new species of food organisms within one day after their release into the sea.

67.48.58098

14.3. 29 Borzenko,M.P.

[Current state of the Caspian stock of stellate sturgeon and forecast of changes in its abundance due to control of river flow.]

Tr Vses Nauch Issled Inst Morskogo Rybn Khoz Okeanogr 52: 259-286. 1964. From : Ref Zh Biol, 1964, No 24198. (Translation).

597.442(262.81)

During the past 30 years the catches of stellate sturgeon (Acipenser stellatus) fluctuated widely as a result of changes in the abundance of the stock, the influence of fishing and changing environmental conditions. The main causes of fluctuations were: inadequate utilization of spawning grounds due to poor organization of the fishing industry; failure to allow necessary numbers of spawners to reach their spawning grounds; and inadequate protection of young and adult fish. The most important spawning rivers are the Volga and the Kura. Before the regulation of the Volga flow, the principal spawning grounds were situated between Kamennyi Yar and Kamshin. In the Kura before the construction of the Mingechaur hydroelectric scheme the spawning grounds were situated on the Araxes River in the region of Karadonla Village. As a result of the control of the Volga flow and the use of practically the entire Araxes for reclamation purposes, natural reproduction will be greatly reduced. Over 60% of the Volga spawning grounds and over 80% of the Kura spawning grounds will be cut off from the sea by dams. A reduction of the river flow and a drop in sea level will lead to a reduction in the area of less saline parts of the sea, which might have an unfavorable effect on the food supply and the growth rate of young sturgeons.

Several measures for augmenting the yield through artificial propagation are suggested.

66.47.10663

14.3.30 Brotskaya, V.A

[Some data on the food of Russian sturgeon and sevriuga of the Central Caspian in 1935-37.]

Tr Vses Nauch-Issled Inst Morskogo Rybn Khoz Okeanogr 54: 49-66. 1964. From: Ref Zh Biol, 1965, No 10I39. (Translation)

597.442(262.81)

Studies on the food of Central Caspian sturgeons are of interest because they characterize the feeding conditions and the diet of sturgeons during the period preceding the acclimatization of Nereis and Syndesmia. The sturgeons find rather favorable feeding conditions in the Central Caspian. The stomach content index averages 24-34%. Empty stomachs occur rarely (14%). The food composition of sturgeons is different in different regions, but practically everywhere the basic food consists of crustaceans (large gammarids and occasionally corophiids, and in deep water Mesidothea entomon for adult individuals; cumaceans, small gammarids and corophiids for young ones) and fish, among whom gobies occur most frequently; herring and sprats are rarely eaten. Sturgeon food in the Chechen Island region differs markedly from that of other regions. Here the indices of fullness are lower: from 8.71 to 17.

averaging 15.6%. The main food consists of bivalves (77.65%), chiefly Cardium (58.1%) and Monodacna (18.7%). Among fish, sprats (9.35%) and herring (9.20%) are eaten more frequent than gobies. The feeding of sevriuga was investigated from larval to adult stages. In the river sevriuga fingerlings feed less intensively (86.1%) than in the pro-estuarine region (187.1%). In the river they eat chironomids and larvae of various insects and oligochaetes, and the young of mollusks. In the pro-estuarine region the food is less varied: small gammarids (79%), chironomids (10%), mysids (7.3%), and cumaceans (1.3%). Feeding conditions of young (20-50 cm long) and adult sevriuga (over 50 cm) in the observation region of the Central Caspian are presented. In some areas sevriuga has the same diet as the Russian sturgeon, but it begins feeding on fish later than the Russian sturgeon does.

66.47. 80600

14.3.31 Kuz'min,A.G.

[Observations on the formation of North-Caspian sevriuga [Acipenser stellatus] stocks.]

Tr Vses Nauch-Issled Inst Morskogo Rybn Khoz Okeanogr 54: 169-174. 1964. From : Ref Zh Biol, 1965, No. 5I29. (Translation)

597.442(262.81)

Size and age composition of sevriuga captured in 1960 and 1961 in the North Caspian were investigated.

The fish ranged in length from 25 to 150 cm, most of them being 50-80 and 80-110 cm long. Age was determined from fin-ray sections. The 1st group of fish had an age of 3+(in 1960) and belonged to the 1957 year-class; the 2nd group ranged from 7+ to 8+ and belonged to the 1952 and 1953 year-classes. These year-classes will provide considerable replenishment of the sevriuga stock in 1966-72. A lower growth rate of sevriuga has been observed in recent years in comparison with the 20's and 30's.

66.47.75744

14.3.32 Piskunov,I.A.

[Distribution of sturgeons in the Caspian Sea.] In: Izmenenia biologicheskikh kompleksov Kaspiiskogo morya za posledniye desyateletiya. [Changes in Caspian biological complexes during the past decade.] Nauka Moscow. 213-233. 1965. From Ref Zh Biol, 1965, No. 20I64. (Translation)

597.442(262.81)

The observations were carried out in April, June, Aug. and Oct. of 1962 in the Central and South Caspian (charts showing the location of the stations and distribution of strugeons are presented). On the spawning grounds Russian sturgeon predominated in the trawl catches. The sevriuga sturgeon catches were about one third the size of the Russian Sturgeon catches, while beluga and spiny sturgeons were taken occasionally. From spring to

fall the Russian sturgeon formed aggregations in shallow waters (upt to the 10-meter isobath). The largest concentrations of this fish occurred in April, June and Aug. between latitude 44° 36' north and longitude 47°36'7" east. In Oct. the concentration of Russian sturgeon in this area sharply decreased, while in the Sulak-Makhachkala region it sharply increased, indicating that the sturgeons had performed migrations. In April and Aug. concentrations of Russian sturgeon were recorded from the region lying between Derbenta and Divichi Village. Along the eastern coast of the North Caspian the sturgeons occurred in significantly smaller numbers than along the western coast. From spring to fall sevriuga live at a depth of 11-25 m., and only a few of them go down deeper to feed. Seasonal migrations of Russian and sevriuga sturgeons mainly depend on feeding and temperature conditions. The densest concentrations were observed in the southwestern part of the North Caspian and in the Dagestan region of the Central Caspian, where the recently introduced Syndesmia and Nereis were undergoing massive development. The preponderance in the trawl catches fish (Russian sturgeon 91-115 cm long and sevriuga 76-105 cm) and the negligible amount of individuals in the 55-to 60-cm range are evidence of a weak recruitment to the commercial sturgeon stock in recent years.

67.48.5859

14.3.33 Noskova, E. D.

[The feeding of smelt in Kura Bay.]

Tr Atlanticheskogo Nauch-Issled Inst Rubn Khoz Okeanogr

10. 87-94. 1963. From: Ref Zh Biol, 1965, No. 5I40. (Translation)

597.553(262.81) smelt

Cladocera are the basic food of smelt, whole Copepoda play a smaller role in its diet. In certain years the role of chironomid larvae increases; cannibalism is observed in a small number of the fish, particularly in years with poor development of zooplankton, Smelt stop eating during the spawning season; in winter its feeding intensity falls off. The fish starts taking food at a length of 5.0-6.0mm. The diet range of smelt reflects the quantitative ratio of organisms present in the zooplankton. Feeding proceeds throughout the 24-hour day, with a maximum in the morning and evening. The abundance of smelt of smelt is determined by the feeding conditions, especially during early developmental stages.

66.47.75756

14.3.34 Shenderyuk,V.I.

[Effect of certain factors on the dynamics of the proteolysis of the "common Caspian kilka" (Clupeonella delicatula caspia).]

Izv Vyssh Ucheb Zavedenii Pishch Tekhnol 4.41-43. Illus. 1965.

597.553.1:577.156(262.81)

Changes in the proportion of the enzyme: substrate

affect the dynamics of proteolysis in the "common Caspian kilka." There is less of an increase in amine N when the substrate is added. Additional application to the (ground) meat of the products of its proteolysis, water, Ca^{+2} and Mg^{+2} at a concentration of 0.002-0.01 M, does not affect the dynamics of proteolysis. There is a great increase in the amount of amine N in the frozen kilka when frozen and fresh kilka undergo proteolysis.

66.47.71217

14.3.35 Krasnova, K.V.

[Reproduction of the Caspian shad Alosa caspia caspia (Eichw.).]

Tr Kaspiiskogo Nauch-Issled Inst Morskogo Rybn Khoz Okeanogr 20: 67-80. 1965. From: Ref Zh Biol, 1965, No 22I59. (Translation)

597.553.1(262.81)

Observations carried out from April 25 to June 20, 1960-61, in the western part of the North Caspian showed that spawning in 1960 started at the same time as in 1961 (end of April), but proceeded differently owing to differences in temperature conditions. In 1961 it was rapid and intensive; in 1960, protracted and feeble. Because of lower temperatures in 1960, mass spawning took place in a shallower region. The composition of the spawning stock differed sharply in these years; in 1960 there was a predominance of 3-year-old males, while in 1961 4-year-old females predominated. Egg loss was greater in 1961;

this is explained by the less favorable hydrochemical conditions during the spawning season of 1961 (sharp drop in temperature, strong winds) as compared with those of 1961.

67.48.16220

14.3.36 Prikhod'ko, B.I.
m [The relative abundance of the Caspian anchovy-like kilka Clupeonella engrauliformis (Borodin).]
Vop Ikhtiol 5(1): 19-29. Illus. Maps. 1965.
597.553.1(262.81)

Electric-light fishery for kilka began in 1948. During the period 1952-1961 the anchovy-like kilka comprised 82 to 95% of the total kilka catch in the Central and northern part of the South Caspian, while the common (C. delicatula) and bigeye kilka (C. grimmi) accounted for only 14 and 7%, respectively. These data refute the widespread belief that the common kilka is more abundant than the anchovy-like form. The great abundance of the latter is explained by its extensive spawning and feeding grounds, its protracted spawning period, as well as by the relatively small number of pelagic competitors for food in the open parts of the Caspian.--D.M. Cutler.

66.47.60782

14.3.37 Svetovidov, A. N.
[The number of Atlantic herring [Clupea harengus harengus and Caspian anchovy [Clupeonella engrauli -

formis] and some factors determining the abundance of Clupeidae.]
Vop Ikhtiol 5(1): 30-37. 1965.
597.553.1(262.81)(261/264) 66.47.80652

14.3.38 Letichevskii, M.A
[Basin and combined culture of whitefish (Caspian inconnu) young in the Volga delta.]
Tr Kasp Nauch Issled Inst Ryb Khoz 22.45-64. 1966. From: Ref Zh Biol, 1967, No. 2I175. (Translation)
597.553.2(262.81)

The observations were made in 1963 at the experimental station of the Caspian Scientific Institute of Marine Fisheries and Oceanography situated below Astrakhan. At the beginning of April, 3-day-old white-fish larvae were placed in basins of the All-Union Scientific Institute of Marine Fisheries and Oceanography. The basins had an area of 5 m^2.On the 5th day after hatching, at a certain time of day (9 and 15 hr.), the larvae were fed with small-sized plankton first, the daily ration during this period comprising 40-50 percent of larval weight. Soon thereafter they were given vitamized fodder consisting of 80 percent oligochaetes and 20 percent zooplankton, the daily ration averaging 30-35 percent of larval weight. At 45 days viable larvae of up to 1 g were obtained.In basin culture, in which supplementary food is provided, 1000 m^2or 100 basins of 10 m^2each are sufficient for the

rearing of 1,200,000 whitefish young; in pond culture, 48 ha. are required. Illumination of tanks by night ensures fuller utilization of food and a better growth rate of young. The initial stocking rate is 3000 to 4000 specimens/m^2; at the end of May it is 1500 specimens/m^2. The young should be released at the end of May Combined culture (growing the larvae in basins on mixed food up to 20-25 mg and then planting them in ponds) requires less fodder and may serve as a biological method for the control of phyllopods. The transport of young from hatcheries to the sea needs to be improved.

67.48.94373

14.3.39 Dorofeeva, E.A.

[Karyological basis for the systematic position of the Caspian and Black Sea salmonids (Salmo trutta caspius Kessler, Salmo trutta labrax pallas).]

Vop Ikhtiol 5(1): 38-45. Illus. 1965.

597.553.2(262.81+262.5)

Chromosome studies, carried out in 1962 and 1963, suggest that the Caspian and Black Sea salmons are genetically close to the sea trout Salmo trutta trutta, and that they should be regarded as sspp. of the latter. The resemblance is reflected not only in the equal numbers of chromosome (2n= 80), but also in their structure.In both the Caspian and Black Sea salmon, as in the sea trout, the nuclei were found to contain 16 metacentric chromosomes, 2 submetacentric ones, and 62 acrocentric. No

secondary contraction was observed in any of the chromosomes studied.--D.M. Cutler.

66.47.59903

14.3.40 Kuliev, Z.M.

[Contributions to the morphology and biology of the roach-kutum hybrid.]

In: Gidrobiologicheskie i ikhtiologicheskie issledovaniya na yuzhnom Kaspii i vnutrennykh vodomakh Azerbaidzhana. [Hydrobiological and ichthyological studies in the South Caspian and the inland waters of Azerbaidzhan.] Akad. Nauk Azerbaidzh. SSR. Baku. 86-95. 1965. From: Ref Zh Biol, 1965, No. 17I4 (Translation)

597.554.3:591.158.1(262.81)

In 1960-62 roach-kutum hybrids were discovered in Kyzylagach Bay. In respect to body length, body depth, pre-and post-dorsal distances and eye diameter the hybrid is intermediate between the parental forms. The same is true of a number of biological features (Condition and others). The hybrid was found to grow well, approaching kutum in growth characteristics. It matures in the 3rd or 4th year of life. Absolute fecundity averages 56,000 eggs and increases with age. The hybrid's spawning period coincides with that of roach and kutum.

67.48.036

14.3.41 Payusova, A.N.

[Observations of elementary populations of young Caspian roach (Rutilus rutilus caspicus Jak.) In rivers by labelling [with P^{32}].]

Byul Moskov Obshchest Ispytatelei Prirody OTD Biol 70(2): 47-54. Illus. 1965. [Engl. summ.]

597.554.3(262.81)

A study has been carried out on the migration pattern of young fish from spawning place in the Volga delta to the prodelta. Elementary populations were studied by direct observations as well as with P^{32}. It was found that the elementary populations of Rutilus rutilus arise within the region of the spawning place and persist during migration and fattening in the prodelta and the sea. The results obtained by both methods are in good agreement so that the simpler method of direct observation can be used.

66.47.60775

14.3.42 Azizova, N.A.

[Observations on the food of gobies in the Caspian Sea.]

UCH Zap Dagestanskogo Gos Pedagog Inst 4: 151-168. 1964. From: Ref Zh Biol, 1965, No. 6I20. (Tranlation)

597.585.1(262.81)

Eight species of gobies were studied Gobius melano-

stomus, G. fluviatilis pallasi, Proterorhinus marmoratus, Benthophilus stellatus leobergius, G. eurystomus, G. bathybius, G. Caspius, G. gorlap (458 specimens). The main food of North-Caspian gobies consisted of mysids, Dreissena, Didacana, Berg's and Knipovich's gobies. The diet of gobies changes considerably with age. Judging by the slow growth of North-Caspian gobies, the feeding conditions in this region must be relatively poor. In the Central Caspian, the extremely abundant Neogobius melanostomus feeds predominantly on molluscs, the biomass of which is very large in this region. The growth rate and abundance of N. melanostomus are significantly higher in the Central Caspian than in other regions of the Caspian.

66.47.55656

14.3.43 Ragimov, D.B.

[On the migration of gobies and the possibility of catching them off the western coasts of the Central and South Caspian.]

In: Gidrobiologicheskie i ikhtiologicheskie issledovaniya na Yuzhnom Kaspii i vnutrennykh vodoemakh Azerbaidzhana. [Hydrobiological and ichthyological studies in the South Caspian and in the inland waters of Azerbaidzhan.] Akad. Nauk Azerb. SSR: Baku. 132-144. 1965. From: Ref Zh Biol 1965,No. 16I88. (Translation)

597.585.1(262.81)

In spring gobies approach the coast to spawn and to

feed. The times of approach are governed by the water temperature. In the South Caspian the shoreward approach starts earlier than in the Central Caspian, and in warm years earlier than in cold ones. The first to approach the South Caspian coast are Neogobius syrman and Gobius kessleri. After spawning the deep-sea goby descends into the depths, the other species keeping to the shore somewhat longer--until the time of winter cooling. The young of large species of gobies, as well as the small species, are eaten by sturgeons, zanders, and seals. Gobies are taken frequently and in large quantities in the Kura, Sarin, Lenkoran, and the northern shad-producing region of Azerbaidzhan. In the Apsheron and Astara regions the goby catch is poor.

67.48.661

14.3.44 Kuleshova, L.V.

Bird types of the Lower Volga and adjacent areas of the North Caspian.]

In: Ornitologiya. [Ornithology.] Moscow. 7.235-243. 1965. From: Ref Zh Biol, 1966, No. 3I320.(Translation)

598.2(262.81)

Investigations were made of the fairly large geographic types of the bird population, separated empirically according to the degree of similarity and difference of the main body of background spp. occurring in different areas. An attempt has been made to separate the types into

subtypes, characterized by changes in and additions to the composition of dominant spp., as well as by qualitative changes in the group of dominants. In the Volga valley, from Volgograd to the islands of the North Caspian, the avian population has been divided into 4 types. The 1st type, with a predominance of corvid birds (rook, crow, magpie), starling, tree sparrow and great titmouse, is distributed throughout the Volga-Akhtuba flood plain, and also in the upper and middle sections of the delta. The 2nd type, with a predominance of the broad-tailed moorhen, gressorial bird groups and common cormorant, is restricted to the islands of the emergent part of the delta that borders the sea. The 3rd type, with a predominance of the bearded titmouse, gallinules, waterfowl, gressorial birds and common cormorant are distributed in shallow bays and pro-estuarine regions. The 4th type, with a predominance of various types of terns, is found on the islands of the North Caspian.

67.48.36336

14.3.45 Baziev, Zh. Kh.

[Reproduction of the Caspian snowpartridge (Tetraogallus caucasicus).]

Zool Zh 44(8): 1219-1227. Illus. 1965. [Engl. summ.]

598.617.1(262.81)

Breeding season, the number of eggs per clutch, period of embryonic development of the young, character of poste-

mbryonic development, mortality of the young and the role played by the male in reproduction are described. The eggs of T. caucasicus Pall. are shown to be the largest both in absolute and relative weight of those of all the Gallinae not dwelling in high mountains, and this is shown to be connected with the evolution of this species under the conditions of severe high mountainous conditions.

66.47.55698

14.3.46 Zhirnov, L.V.

[The seasonal migrations of saiga antelopes in the West Caspian region. (paper read by the author at the meeting of the Zoological Section, in December, 1958).]

Byul, Mosk. Obshch.Ispytat. Prirody. Otdel. Biol. 64(5): 134. 1959; Referat. Zhur., Biol.,1960, No. 100299. (Translation)

599.735(262.81)

A count made in 1958 in the West Caspian region, indicated the presence of about 540,000 saiga antelopes. They are usually found within large areas, and often change pastures. From the beginning of April the saigas migrate northward from their winter sites(Chernye Zemil, near the Manyeh steppes), to the sites of mass calving (Sarpa lakes). After calving (10-12 May) the saiga females, with their young, become widely distributed over

the Caspian region, seeking places with rich vegetation. In years of drought they concentrate near watering areas. --Courtesy NSF (PL 83-480) 1963.

67.48.79125

14.3.47 Ivanov,V.V.

[Rare cases of death of seals.]

Priroda 10.113.1959; Referat. Zhur., Biol., 1960,No. 86646. (Translation)

599.745.3(262.81)

The remains of 7 seals were found in the sands of the dried-up bay Mertvyi Kultuk, 12-15 km from the shore of the Caspian Sea. The animals apparently died when they drifted into the bay with a water current produced by strong sea winds.--Courtesy NSF (PL 83-480)1963.

66.47.85752

PLANT INJURIES DISEASES, PESTS.

632

14.3.48 Bogdanov, M.P.
[Weeds of the Caspian Sea area and the Khachmaz Lowland.]
Izv Akad Nauk Azerbaidzh SSR Ser Biol Nauk 6.3-10. 1964

66.47.4111

632.51(262.81)

639

639 FISHERIES

14.3.49 Vinogradov, L.G.; Yablonskaya, E.A.
[Problems of improving the fisheries of the Caspian Sea.]
In: Izmenenia biologicheskikh kompleksov Kaspiiskogo morya za posledniye desyatiletiya. [Changes in Caspian piological complexes during the past decade.] Nauka: Moscow. 3-53. 1965. From : Ref Zh Biol, 1965, No 20I63. (Translation)

639.2(262.81)

As a result of the drop in the Caspian Sea level,the surface area has been reduced by 32,000 km^2, and the average depth by 2 m. With the disappearance of the eastern branches, the outflow of Volga water in the western part of the delta increased, as a consequence of which the salinity in the eastern part of the North Caspian started to rise. Construction of large reservoirs and alteration of the Volga flow, brought about by the operation of the hydroelectric power plant, had an adverse effect on the biogenic discharge of the Volga and on the salinity and feeding condtions of the North Caspian. The decline in the production of primary organic substances has had an adverse effect on zooplankton development. The biomass of benthos, the basic food of roach, bream, Russian and Sevrigua sturgeons, diminished as a result of unfavorable changes in feeding conditions, though introduced salt-adopted species increased. The feeding conditions of semi-migratory fishes in the North Caspian worsened owing to the curtailment of the habitat of roach and bream by the increase in the salt content of the water (their range of distribution is limited to salinities less than 8-10%); in the eastern section of the shallows the impoverishment of conditions was particularly clearly marked. The basic amelioration problem --preservation of the water level-is being solved by diverting the flow of the Pechora and Vychegda Rivers into the Volga. This will add approximately 37 to 38 km^3 of water to the Volga annually,thereby stabilizing its level. But this measure will not restore the flooding of the spawning grounds in the Volga delta during the reproductive period

of semi-migratory fishes, because the inflow from the northern rivers will enter the Lower Volga basin during low-water level. The most favorable conditions for the nautral reproduction of semi-migratory fishes in the delta, and some improvement of the North Caspian's bio-hydrological regime, can be achieved through construction of a water separator, such as a sectional dam in the upper reaches of the Volga delta, with a dike extending from it to the sea. The dam will alter the distribution of the discharge between the western and eastern branches of the delta; in years of low water-level nearly 2/3 of the discharge will flow eastward, thus supplying this part of the delta with water, as under natural conditions. Establishment of fish hatcheries and commercial pond fisheries in the western part of the delta is envisaged. Construction of the projected Lower-Volga hydroleectric power plant in the immediate vicinity of the Volga delta will inhibit the irrigation of natural spawning grounds, will seriously disrupt the overwintering conditions of fishes and will almost completely eliminate the natural propagation of sturgeons in the Volga. Apart from this, construction of the dam will make it difficult to supply fish hatcheries with spawners and is bound to create considerable uncertainty with respect to the productivity of the Volga sturgeon stocks. Increase in salinity in the eastern part of the North Caspian can be avoided, and natural reproduction of semi-migratory fishes and sturgeons in the Ural imporved, by constructing the Volga-Ural canal which will raise the annual Ural run-off by

5-10 km^3 and increase the freshwater inflow to the eastern half of the North Caspian.

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