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WANG, X., LI, X., YUAN, F., LI, C., JIA, B. AND JIANG, S. miR-216b downregulates intestinal IL2RB to inhibit the invasion of <i>Echinococcus granulosus</i> eggs in the Kazakh Sheep.....	1641
---	------

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WANG, Z., LIU, W. AND TAI, F. Circadian activity patterns and time budgets of the complex-toothed flying squirrel (<i>Trogopterus xanthipes</i>) in different seasons	1683
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YANG, Y., ZHANG, T., RONG, M., XU, J.P. AND XING, X. Energy requirement for growing mink fed on diets of different energy levels.....	1905
AHMAD, A.M., JAMAL, M.A., SATTAR, A., GHAFOR, A., JAVEED, A. AND RIAZ, A. Artificial activation of mouse oocytes with SrCl ₂ with minimal detrimental effect on early embryonic development.....	1913
BIBI, N., JAN, F., AHMAD, M.S. AND WANG, H. Effect of luminance on visual performance by secondary cavity and non-cavity nesting passerines (S.C.).....	1973

Microbiology

MUZAMMIL, I., SALEEM, M.I., AQIB, A.I., ASHAR, A., MAHFOOZ, S.A., RAHMAN, S., SHOAIB, M., NASEER, M.A., SOHRANI, I.K., AHMAD, J., SAQI, R., LODHI, F.L. AND TANVEER, Q. Emergence of pathogenic strains of <i>Staphylococcus aureus</i> in goat milk and their comparative response to antibiotics.....	1659
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Fish Biology/Fisheries/Aquaculture

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---	--

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Pest & Pest Control	
YANG, S., ZHAO, H., ZHANG, X., XU, K., GUO, L., DU, Y. AND JIANG, Y. Identification and expression patterns of chemosensory genes in male and female wax moths, <i>Galleria mellonella</i>	1767
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LI, W.F., ZHANG, R.Y., YIN, J., SHAN, H.L., CANG, X.Y., LUO, Z.M., WANG, X.Y., LI, J. AND HUANG, Y.K. Effects of a new sex pheromone trap and biological agents on the control of <i>Sesamia inferens</i> Walker and <i>Argyroplote schistaceana</i> (Snellen) (S.C.).....	1985
Herbal Medicine	
RAFEEQ, M., RASHID, N., TARIQ, N.M., SHEIKH, I.S., MUSTAFA, M.Z., SHAFEE, M., MEHMOOD, K., BILAL, R.M. AND ASMAT, T. Effect of herbal extract on the growth performance, serum biochemical composition, ileal histomorphology and immune response of broiler chickens.....	1793
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DOGAN, N. AND ADANACIOGLU, H. Performance evaluation of beekeeping farms: A case study from Gümüşhane, Turkey	1837
SARWAR, Z.M., MALIK, A.I., SUHAIL, M., SAEED, S., SIAL, M.U., JALEEL, W., NAQQASH, M.N. AND SAEED, Q. Genus <i>Spodoptera</i> (Hadeninae: Noctuidae: Lepidoptera): A new species from Southern Punjab, Pakistan (S.C.)	1981
Parasitology	
MOHAMED, R., NADER, S., HAMZA, D. AND SABRY, M.A. Emergence of <i>Cryptococcus</i> spp. in donkeys in Egypt: A potential public health concern.	1873
Virology	
KIANI, S.T., RAUF, A., KAZMI, S.A., SHAFI, N., KHALID, M., LATIF, N., GUL, S., YOUSAF, S. AND ARSHAD, M. Prevalence of hepatitis B, C and tuberculosis in under privileged children (Orphans) of District Bagh, Azad Jammu and Kashmir.....	1897
MUBASHAR, S., MUKHTAR, T. AND KHAN, N.A. Coronavirus disease (COVID 19) with special reference to Pakistan: A review on its different aspects.....	1947
YASMEEN, R., MOBEEN, N. AND CHAUDHRY, S. COVID 19 and cardiovascular diseases	1961
NADEEM, S.M., KHAN, M.R., ASLAM, A., SHEIKH, A.A., AHMAD, A., MANSOOR, S.N. AND ANEES, M. Cytological changes in chicken infectious anemia virus infected bone marrow in broilers (S.C.).....	1989
Toxicology	
RAZZAQ, A., ABDULLAH, S., NAZ, H., ABBAS, K. SHAFIQUE, L. AND LIU, Q. Micronuclei Assay: A suitable tool for evaluating the heavy metals induced genotoxicity in fish, <i>Labeo rohita</i> (S.C.)	1997
Animal Disease	
GUL, S., AHMED, S., USMAN, T., KHAN, K., AYAZ, S., GUL, S. AND ALI, N. Prevalence of <i>Anaplasma marginale</i> in tropical area of Khyber Pakhtunkhwa, Pakistan (S.C.).....	1977
NUMBER 6	
Physiology	
ERDOGAN, R., TEL, M., CINAR, V. AND PALA, R. Effect of regular exercise on fat metabolism in rats fed on zinc picolinate supplemented diet.	2001
ABBAS, A., KHAN, J., HASSAN, M.A., QAYYUM, A. AND SHAFIQ, H. Bioaccumulation of heavy	

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YAN, W., ZHOU, Q., LIU, B., SUN, C., ZHANG, H. AND SONG, C. <i>Isaria cicadae</i> Miquel improves the growth performance, physiological response and meat quality of giant freshwater prawn, <i>Macrobrachium rosenbergii</i>	2135
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ZHOU, B., MANGUKIYA, H.B., MERUGU, S.B., YUNUS, F., FAN, Y., WU, Z. AND LI, D. Cloning, expression, purification, and characterization of soluble bioactive recombinant human anterior gradient homolog 2 - DsRed monomer protein in <i>Escherichia coli</i>	2021
NING, G.B., NIU, S., LI, Y.J., LU, X.X., YANG, S.X., JAHEJO, A.R., ZHANG, D., HAO, W.F., GAO, W.W., ZHAO, Y.J., LI, J.H., YAN, F., GAO, R.K., BI, Y.H., TIAN, W.X. AND HAN, L.X. Transcriptome analysis reveals the immune response of chicken erythrocytes to Marek's disease virus infection	2057
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Fish Biology/Fisheries

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