Supplementary Material

Table S1. List of articles selected and references

Bio-monitoring of Tissue Accumulation and Genotoxic Effect of Heavy Metals in *Cyprinus carpio* from River Kabul Khyber Pakhtunkhwa Pakistan.	(Siraj, Khisroon *et al.* 2018)
Use of statistical analysis to validate ecogenotoxicology findings arising from various comet assaycomponents.	(Hussain, Sultana *et al.* 2018)
2,4-Dichlorophenol induces DNA damage through ROS accumulation and GSH depletion in goldfish *Carassius auratus.*	(Huang, Zhang *et al.* 2018)
Use of integrated biomarker indexes for assessing the impact of receiving waters on a native neotropical teleost fish.	(Baudou, Ossana *et al.* 2018)
Waterborn Genotoxicity in Southern Brazil Using *Astyanax bifasciatus* (Pisces: Teleostei).	(Wachtel, de Oliveira *et al.* 2018)
DNA damage in dab (*Limanda limanda*) and haddock (*Melanogrammus aeglefinus*) from European seas.	(Hylland, Skei *et al.* 2017)
Microelectrophoretic study of environmentally induced DNA damage in fish and its use for early toxicity screening of freshwater bodies.	(Hussain, Sultana *et al.* 2017)
A comparative approach using biomarkers in feral and caged Neotropical fish: Implications for biomonitoring freshwater ecosystems in agricultural areas.	(Vieira, Costa *et al.* 2017)
Embryotoxic and genotoxic effects of sewage effluents in zebrafish embryo using multiple endpoint testing.	(Babic, Barisic *et al.* 2017)
Physico-chemical and genotoxicity analysis of Guaribas river water in the Northeast Brazil.	(Sousa, Peron *et al.* 2017)
Evaluation of DNA damage and physiological responses in Nile tilapia, *Oreochromis niloticus* (Linnaeus, 1758) exposed to sub-lethal diclofenac (DCF).	(Pandey, Ajima *et al.* 2017)
Assessment of urban stream sediment pollutants entering estuaries using chemical analysis and multiple bioassays to characterise biological activities.	(Boehler, Strecker *et al.* 2017)
Bioaccumulation of trace metals and total petroleum and genotoxicity responses in an edible fish population as indicators of marine pollution.	(D'Costa, Shyama *et al.* 2017)

Effects of gamma radiation on the early developmental stages of Zebrafish (*Danio rerio*).	(Kumar, Shyama *et al.* 2017)
Multiple biomarker responses (serum biochemistry, oxidative stress, genotoxicity and histopathology) in *Channa punctatus* exposed to heavy metal loaded waste water.	(Javed, Ahmad *et al.* 2017)
DNA damage and cytotoxicity induced on common carp by pollutants in water from an urban reservoir. Madín reservoir, a case study.	(Perez-Coyotl, Martinez-Vieyra *et al.* 2017)
The influence of heavy metals on toxicogenetic damage in a Brazilian tropical river.	(Matos, Cunha *et al.* 2017)
Multivariate and integrative approach to analyze multiple biomarkers in ecotoxicology: A field study in Neotropical region.	(Ghisi, Oliveira *et al.* 2017)
Bioassessment of the Effluents Discharged from Two Export Oriented Industrial Zones Located in Kelani River Basin, Sri Lanka Using Erythrocytic Responses of the Fish, Nile Tilapia (*Oreochromis niloticus*)	(Hemachandra & Pathiratne 2017)
Evaluation of genotoxic potential in the Velika Morava River Basin in vitro and in situ.	(Jovanovic, Kolarevic *et al.* 2017)
In situ assessment of Karaj River genotoxic impact with the alkaline comet assay and micronucleus test, on feral brown trout (*Salmo trutta fario*).	(Hariri, Mirvaghefi *et al.* 2017)
The impact of multiple stressors on the biomarkers response in gills and liver of freshwater breams during different seasons	(Kostic, Kolarevic *et al.* 2017)
Alteration in DNA structure, molecular responses and Na+ -K+ -ATPase activities in the gill of Nile tilapia, *Oreochromis niloticus* (Linnaeus, 1758) in response to sub-lethal verapamil	(Ajima, Pandey *et al.* 2017)
Genotoxicity of Water Contaminants from the Basin of Lake Sevan, Armenia Evaluated by the Comet Assay in Gibel Carp (*Carassius auratus gibelio*) and Tradescantia Bioassays.	(Simonyan, Gabrielyan *et al.* 2016)
Assessing genotoxic effects in fish from a marine protected area influenced by former mining activities and other stressors.	(Gusso-Choueri, Choueri *et al.* 2016)

Bioaccumulation, oxidative stress and genotoxicity in fish (*Channa punctatus*) exposed to a thermal power plant effluent.	(Javed, Ahmad *et al.* 2016)
Assessment of status of three water bodies in Serbia based on tissue metal and metalloid concentration (ICP-OES) and genotoxicity (comet assay).	(Sunjog, Kolarevic *et al.* 2016)
Variation in genotoxic susceptibility and biomarker responses in *Cirrhinus mrigala* and *Catla catla* from different ecological niches of the Chenab River.	(Hussain, Sultana *et al.* 2016)
Evaluation of genetic toxicity caused by acid mine drainage of coal mines on fish fauna of Simsang River, Garohills, Meghalaya, India.	(Talukdar, Kalita *et al.* 2016)
Integrated biomarker response in catfish *Hypostomus ancistroides* by multivariate analysis in the Pirapó River, southern Brazil.	(Ghisi, Oliveira *et al.* 2016)
PAH related effects on fish in sedimentation ponds for road runoff and potential transfer of PAHs from sediment to biota.	(Grung, Petersen *et al.* 2016)
Evaluation of genotoxic potential throughout the upper and middle stretches of Adige river basin.	(Kracun-Kolarevic, Kolarevic *et al.* 2016)
Genotoxicity assessment of the Danube River using tissues of freshwater bream (*Abramis brama*).	(Kostic, Kolarevic *et al.* 2016)
Longitudinal profile of the genotoxic potential of the River Danube on erythrocytes of wild common bleak (*Alburnus alburnus*) assessed using the comet and micronucleus assay.	(Deutschmann, Kolarevic *et al.* 2016)
Toxicity study of ionic liquid, 1-butyl-3-methylimidazolium bromide on guppy fish, *Poecilia reticulata* and its biodegradation by soil bacterium *Rhodococcus hoagii* VRT1.	(Thamke & Kodam 2016)
Evidences of DNA and chromosomal damage induced by the mancozeb-based fungicide Mancozan® in fish (*Anguilla anguilla* L.).	(Marques, Rego *et al.* 2016)
Integrated monitoring of chemicals and their effects on four sentinel species, *Limanda limanda*, *Platichthys flesus*, *Nucella lapillus* and *Mytilus* sp., in Seine Bay: A key step towards applying biological effects to monitoring.	(Burgeot, Akcha *et al.* 2016)

Zebrafish genome instability after exposure to model genotoxicants.	(Srut, Stambuk *et al.* 2015)
Exposure to runoff from coal-tar-sealed pavement induces genotoxicity and impairment of DNA repair capacity in the RTL-W1 fish liver cell line.	(Kienzler, Mahler *et al.* 2015)
Flooding modifies the genotoxic effects of pollution on a worm, a mussel and two fish species from the Sava River.	(Aborgiba, Kostic *et al.* 2015)
DNA damage caused by organic extracts of contaminated sediment, crude, and weathered oil and their fractions recovered up to 5 years after the 2007 Hebei Spirit oil spill off Korea.	(Jeong, Lee *et al.* 2015)
A multibiomarker evaluation of urban, industrial, and agricultural exposure of small characins in a large freshwater basin in southern Brazil.	(Freire, Souza-Bastos *et al.* 2015)
Simulation study of natural UV-B radiation on *Catla catla* and its impact on physiology, oxidative stress, Hsp 70 and DNA fragmentation.	(Singh, Sharma *et al.* 2015)
Toxicity of 8-Hydroxyquinoline in *Cryprinus carpio* Using the Acute Toxicity Test, Hepatase Activity Analysis and the Comet Assay.	(Yan, Chen *et al.* 2015)
In vivo induction of antioxidant response and oxidative stress associated with genotoxicity and histopathological alteration in two commercial fish species due to heavy metals exposure in northern India (Kali) river.	(Fatima, Usmani *et al.* 2015)
Evaluation of genotoxicity and cytotoxicity of water samples from the Sinos River Basin, southern Brazil.	(Bianchi, Goldoni *et al.* 2015)
Embryotoxicity and genotoxicity evaluation of sediments from Yangtze River estuary using zebrafish (*Danio rerio*) embryos.	(Li, Chen *et al.* 2015)
Multibiomarker in fish to evaluate a river used to water public supply	(Bueno-Krawczyk, Guiloski *et al.* 2015)
Developmental toxicity of PAH mixtures in fish early life stages. Part I: adverse effects in rainbow trout.	(Le Bihanic, Morin *et al.* 2014)
Developmental toxicity of PAH mixtures in fish early life stages. Part II: adverse effects in Japanese medaka.	(Le Bihanic, Clerandeau *et al.* 2014)

Variability in DNA damage of chub (*Squalius cephalus* L.) blood, gill and liver cells during the annual cycle.	(Sunjog, Kolarevic *et al.* 2014)
Assessment of genotoxic induction and deterioration of fish quality in commercial species due to heavy-metal exposure in an urban reservoir.	(Fatima, Usmani *et al.* 2014)
Reduction of acute toxicity and genotoxicity of dye effluent using Fenton-coagulation process.	(Zhang, Chen *et al.* 2014)
Comparative effects of biological and chemical dispersants on the bioavailability and toxicity of crude oil to early life stages of marine medaka (*Oryzias melastigma*).	(Mu, Jin *et al.* 2014)
In situ assessment of a neotropical fish to evaluate pollution in a river receiving agricultural and urban wastewater.	(Ghisi, de Oliveira *et al.* 2014)
Genotoxic and teratogenic effect of freshwater sediment samples from the Rhine and Elbe River (Germany) in zebrafish embryo using a multi-endpoint testing strategy.	(Garcia-Kaufer, Gartiser *et al.* 2014)
Cytotoxic and genotoxic responses of the RTgill-W1 fish cells in combination with the yeast oestrogen screen to determine the sediment quality of Lagos lagoon, Nigeria.	(Amaeze, Schnell *et al.* 2014)
Assessment of pollution of river Ganges by tannery effluents using genotoxicity biomarkers in murrel fish, *Channa punctatus* (Bloch).	(Nagpure, Srivastava *et al.* 2014)
Monitoring exposure of brown bullheads and benthic macroinvertebrates to sediment contaminants in the Ashtabula river before, during, and after remediation	(Meier, Lazorchak *et al.* 2014)
Characterization of a genotoxicity biomarker in three-spined stickleback (*Gasterosteus aculeatus* L.): Biotic variability and integration in a battery of biomarkers for environmental monitoring.	(Santos, Joyeux *et al.* 2014)
Analysis of fish DNA biomarkers as a molecular-level approach for ecological health assessments in an urban stream.	(Kang, Kang *et al.* 2014)
Genotoxicological response of the common carp (*Cyprinus carpio*) exposed to spring water in Tlaxcala, México.	(Garcia-Nieto, Juarez-Santacruz *et al.* 2014)

Integrated biomarker response index using a Neotropical fish to assess the water quality in agricultural areas	(Vieira, Almeida *et al.* 2014)
Interspecies variation in DNA damage induced by pollution	(Sebbio, Carere *et al.* 2014)
Water quality assessment of the Tubaro River through chemical analysis and biomarkers in the Neotropical fish *Geophagus brasiliensis*	(Osorio, Silva *et al.* 2014)
A new approach of Integrated Health Responses (IHR(s)) modeling for ecological risk/health assessments of an urban stream.	(Kim, Yeom *et al.* 2014)
Kinetic response of a genotoxicity biomarker in the three-spined stickleback and implication for environmental monitoring.	(Santos, Palos-Ladeiro *et al.* 2014)
Evaluating the efficiency of advanced wastewater treatment: target analysis of organic contaminants and (geno-)toxicity assessment tell a different story.	(Magdeburg, Stalter *et al.* 2014)
Genotoxic potential and physicochemical parameters of Sinos River, southern Brazil.	(Scalon, Rechenmacher *et al.* 2013)
Comet assay in gill cells of *Prochilodus lineatus* exposed in vivo to cypermethrin.	(Poletta, Gigena *et al.* 2013)
A method for the assessment of DNA damage in individual, one day old, zebrafish embryo (*Danio rerio*), without prior cell isolation.	(Elersek, Plazar *et al.* 2013)
Use of comet assay in the study of DNA break in blood and gill cells of rohu (*Labeo rohita*) after an exposure to furadan, a carbamate pesticide	(Mohanty, Mohanty *et al.* 2013)
DNA damage and oxidative stress modulatory effects of glyphosate-based herbicide in freshwater fish, *Channa punctatus*.	(Nwani, Nagpure *et al.* 2013)
Biomarkers of waterborne copper exposure in the guppy *Poecilia vivipara* acclimated to salt water.	(Machado, Hoff *et al.* 2013)
Assessment of genotoxicity in gonads, liver and gills of zebrafish (*Danio rerio*) by use of the comet assay and micronucleus test after in vivo exposure to methyl methanesulfonate.	(Fassbender & Braunbeck 2013)
Chromium (VI) induced acute toxicity and genotoxicity in freshwater stinging catfish, *Heteropneustes fossilis*.	(Ahmed, Kundu *et al.* 2013)

Comparative study of different exposure routes on the biotransformation and genotoxicity of PAHs in the flatfish species, *Scophthalmus maximus*	(Le Du-Lacoste, Akcha *et al.* 2013)
Variation patterns in individual fish responses to chemical stress among estuaries, seasons and genders: the case of the European flounder (*Platichthys flesus*) in the Bay of Biscay.	(Laroche, Gauthier *et al.* 2013)
Multi-level stressor analysis from the DNA/biochemical level to community levels in an urban stream and integrative health response (IHR) assessments.	(Lee, Kim *et al.* 2013)
Biomarker responses in mudskipper (*Periophthalmus waltoni*) from the coastal areas of the Persian Gulf with oil pollution.	(Shirani, Mirvaghefi *et al.* 2012)
Biochemical and bioaccumulation approaches for investigating marine pollution using Mediterranean rainbow wrasse, *Coris julis* (Linneaus 1798).	(Tomasello, Copat *et al.* 2012)
The effects of urbanization on *Lepomis macrochirus* using the comet assay.	(Otter, Meier *et al.* 2012)
Handling of Astyanax sp. for biomonitoring in Cangüiri Farm within a fountainhead (Iraí River Environment Preservation Area) through the use of genetic biomarkers.	(Ramsdorf, Vicari *et al.* 2012)
Biomonitoring of Microcystin and Aflatoxin Co-Occurrence in Aquaculture Using Immunohistochemistry and Genotoxicity Assays	(Hashimoto, Kamogae *et al.* 2012)
Heavy metal accumulation and the genotoxicity in barbel (*Barbus barbus*) as indicators of the Danube river pollution.	(Sunjog, Gacic *et al.* 2012)
In situ evaluation of the genotoxic potential of the river Nile: II. Detection of DNA strand-breakage and apoptosis in *Oreochromis niloticus niloticus* (Linnaeus, 1758) and *Clarias gariepinus* (Burchell, 1822).	(Osman, Abuel-Fadl *et al.* 2012)
Genotoxic effects in the Eastern mudminnow (*Umbra pygmaea*) after prolonged exposure to River Rhine water, as assessed by use of the in vivo SCE and Comet assays.	(Penders, Spenkelink *et al.* 2012)
Genotoxic effects in fish induced by pharmacological agents present in the sewage of some Italian water-treatment plants.	(Rocco, Frenzilli *et al.* 2012)

Comet assay and micronucleus test in circulating erythrocytes of *Aequidens tetramerus* exposed to methylmercury.	(Rocha, Cavalcanti *et al.* 2011)
Evaluation of DNA damage in common carp (*Cyprinus carpio* L.) by comet assay for determination of possible pollution in Lake Mogan (Ankara).	(Cok, Ulutas *et al.* 2011)
Temporal and geographical trends in the genotoxic effects of marine sediments after accidental oil spill on the blood cells of striped beakperch (*Oplegnathus fasciatus*).	(Lee, Shim *et al.* 2011)
In vivo and in vitro exposures for the evaluation of the genotoxic effects of lead on the Neotropical freshwater fish *Prochilodus lineatus*.	(Monteiro, Cavalcante *et al.* 2011)
Genotoxic damages in zebrafish submitted to a polymetallic gradient displayed by the Lot River (France).	(Orieux, Cambier *et al.* 2011)
Toxicity evaluation of water samples collected near a hospital waste landfill through bioassays of genotoxicity piscine micronucleus test and comet assay in fish *Astyanax* and ecotoxicity *Vibrio fischeri* and *Daphnia magna.*	(Erbe, Ramsdorf *et al.* 2011)
Removal of pollutants and reduction of bio-toxicity in a full scale chemical coagulation and reverse osmosis leachate treatment system.	(Theepharaksapan, Chiemchaisri *et al.* 2011)
Mutagenic impact on fish of runoff events in agricultural areas in south-west France.	(Polard, Jean *et al.* 2011)
DNA integrity of chub erythrocytes (*Squalius cephalus* L.) as an indicator of pollution-related genotoxicity in the River Sava.	(Pavlica, Stambuk *et al.* 2011)
Exposure to persistent organic pollutants (POPs) and DNA damage as an indicator of environmental stress in fish of different feeding habits of Coatzacoalcos, Veracruz, Mexico.	(Gonzalez-Mille, Ilizaliturri-Hernandez *et al.* 2010)
Evaluation of Sinos River water genotoxicity using the comet assay in fish.	(Scalon, Rechenmacher *et al.* 2010)
Relationship between PAH biotransformation as measured by biliary metabolites and EROD activity, and genotoxicity in juveniles of sole (*Solea solea*).	(Wessel, Santos *et al.* 2010)

DNA damage, severe organ lesions and high muscle levels of As and Hg in two benthic fish species from a chemical warfare agent dumping site in the Mediterranean Sea	(Della Torre, Petochi *et al.* 2010)
Comparison of in vitro and in situ genotoxicity in the Danube River by means of the comet assay and the micronucleus test.	(Boettcher, Grund *et al.* 2010)
Cage exposure of European sea bass (*Dicentrarchus labrax*) for in situ assessment of pollution-related genotoxicity.	(Srut, Stambuk *et al.* 2010)
A multibiomarker approach in *Coris julis* living in a natural environment.	(Fasulo, Marino *et al.* 2010)
Estimation of DNA integrity in blood cells of eastern mosquitofish (*Gambusia holbrooki*) inhabiting an aluminium-polluted water environment: an alkaline comet assay study.	(Ternjej, Mihaljevic *et al.* 2010)
Genetic, biochemical, and individual responses of the teleost fish *Carassius auratus* to uranium.	(Lourenco, Castro *et al.* 2010)
Anchoring novel molecular biomarker responses to traditional responses in fish exposed to environmental contamination.	(Nogueira, Pacheco *et al.* 2010)
Genotoxicity assessment in aquatic environment impacted by the presence of heavy metals.	(Barbosa, Cabral *et al.* 2010)
Genotoxicity of two pathogenic strains of zoosporic fungi (*Achlya klebsiana* and *Aphanomyces laevis*) on erythrocytes of Nile tilapia *Oreochromis niloticus niloticus*.	(Osman, Ali *et al.* 2010)
Genotoxicity monitoring of freshwater environments using caged carp (*Cyprinus carpio*).	(Klobucar, Stambuk *et al.* 2010)
Evaluation of DNA damage induced by environmental exposure to mercury in *Liza aurata* using the comet assay.	(Pereira, Guilherme *et al.* 2010)
Alkaline comet assay for genotoxic effect detection in neotropical fish *Prochilodus lineatus* (Pisces, Curimatidae).	(Simoniello, Gigena *et al.* 2009)
Profile of micronucleus frequencies and DNA damage in different species of fish in a eutrophic tropical lake.	(Grisolia, Rivero *et al.* 2009)

Genotoxic and Neurotoxic Potential in Marine Fishes Exposed to Sewage Effluent from a Wastewater Treatment Plant	(Park, Kim *et al.* 2009)
Genotoxic evaluation of different doses of inorganic lead (PbII) in *Hoplias malabaricus.*	(Ramsdorf, Ferraro *et al.* 2009)
An assessment of acute biomarker responses in the demersal catfish *Cathorops spixii* after the Vicuña oil spill in a harbour estuarine area in Southern Brazil.	(Katsumiti, Domingos *et al.* 2009)
Cellular responses in the cyprinid *Leuciscus cephalus* from a contaminated freshwater ecosystem.	(Frenzilli, Falleni *et al.* 2008)
Application of a New Bioassay Technique Using Goldfish for Assessment of Water Toxicity	(Deguchi, Wu *et al.* 2008)
Genotoxic damage in *Solea senegalensis* exposed to sediments from the Sado Estuary (Portugal): effects of metallic and organic contaminants.	(Costa, Lobo *et al.* 2008)
Evaluation of genotoxicity and effects on reproduction of nonylphenol in *Oreochromis niloticus* (Pisces: Cichlidae).	(Rivero, Barbosa *et al.* 2008)
Monitoring of DNA breakage in embryonic stages of the African catfish *Clarias gariepinus* (Burchell, 1822) after exposure to lead nitrate using alkaline comet assay.	(Osman, Mekkawy *et al.* 2008)
Genotoxic effects in the Eastern mudminnow (*Umbra pygmaea* L.) after exposure to Rhine water, as assessed by use of the SCE and Comet assays: A comparison between 1978 and 2005	(Alink, Quik *et al.* 2007)
Genotoxic and mutagenic effects of diesel oil water soluble fraction on a neotropical fish species.	(Vanzella, Martinez *et al.* 2007)
Hepatic biomarkers of sediment-associated pollution in juvenile turbot, *Scophthalmus maximus* L.	(Hartl, Kilemade *et al.* 2007)
Genotoxic damage in field-collected three-spined sticklebacks (*Gasterosteus aculeatus* L.): a suitable biomonitoring tool?	(Wirzinger, Weltje *et al.* 2007)
Evaluation of mutagenic activities of leachates in landfill sites by micronucleus test and comet assay using goldfish.	(Deguchi, Toyoizumi *et al.* 2007)

Dna damage and external lesions in brown bullheads (*Ameiurus Nebulosus*) from contaminated habitats.	(Yang, Meier *et al.* 2006)
Comet assay for the detection of genotoxicity in blood cells of flounder (*Paralichthys olivaceus*) exposed to sediments and polycyclic aromatic hydrocarbons.	(Woo, Kim *et al.* 2006)
Biomarkers in croakers *Micropogonias furnieri* (Teleostei: Sciaenidae) from polluted and non-polluted areas from the Patos Lagoon estuary (Southern Brazil): evidences of genotoxic and immunological effects.	(Amado, da Rosa *et al.* 2006)
Biomarkers of exposure and effect in the Brazilian flounder *Paralichthys orbignyanus* (Teleostei: Paralichthyidae) from the Patos Lagoon estuary (Southern Brazil).	(Amado, Robaldo *et al.* 2006)
A battery of in vivo and in vitro tests useful for genotoxic pollutant detection in surface waters.	(Pellacani, Buschini *et al.* 2006)
Analysis of CYP4501A1, PAHs metabolites in bile, and genotoxic damage in *Oncorhynchus mykiss* exposed to Biobío River sediments, Central Chile.	(Inzunza, Orrego *et al.* 2006)
Comparative evaluation of the alkaline comet assay with the micronucleus test for genotoxicity monitoring using aquatic organisms.	(Kim & Hyun 2006)
Detection of DNA damage by alkaline single cell gel electrophoresis in 2,4-dichlorophenoxyacetic-acid- and butachlor-exposed erythrocytes of *Clarias batrachu*	(Ateeq, Abul Farah *et al.* 2005)
Analysis of DNA damage in sea lamprey (*Petromyzon marinus*) spermatozoa by UV,hydrogen peroxide, and the toxicant bisazir.	(Ciereszko, Wolfe *et al.* 2005)
Fish as bioindicators to assess the effects of pollution in two southern Brazilian rivers using the Comet assay and micronucleus test.	(Andrade, Silva *et al.* 2004)
Genotoxic and teratogenic potential of marine sediment extracts investigated with comet assay and zebrafish test.	(Kammann, Biselli *et al.* 2004)
A 2.5-year genotoxicity profile for a partially restored polluted river.	(Avishai, Rabinowitz *et al.* 2004)
Measurement of DNA adducts and strand breaks in dab (*Limanda limanda*) collected in the field: effects of biotic (age, sex) and abiotic (sampling site and period) factors on the extent of DNA damage	(Akcha, Leday *et al.* 2004)

DNA damage in eelpout (*Zoarces viviparus*) from Göteborg harbour.	(Frenzilli, Scarcelli *et al.* 2004)
Genotoxicity of field-collected inter-tidal sediments from Cork Harbor, Ireland,to juvenile turbot (*Scophthalmus maximus* L.) as measured by the Comet assay.	(Kilemade, Hartl *et al.* 2004)
Comet assay using mullet (*Mugil* sp.) and sea catfish (*Netuma* sp.) erythrocytes for the detection of genotoxic pollutants in aquatic environment.	(de Andrade, de Freitas *et al.* 2004)
The relationships of biochemical endpoints to histopathology and population metrics in feral flatfish species collected near the municipal wastewater outfall of Orange County, California, USA.	(Roy, Armstrong *et al.* 2003)
Genotoxicity of a polluted river system measured using the alkaline comet assay on fish and earthworm tissues.	(Raiaguru, Suba *et al.* 2003)
Anesthesia of fish with benzocaine does not interfere with comet assay results.	(Gontijo, Barreto *et al.* 2003)
Potential value of the comet assay and DNA adduct measurement in dab (*Limanda limanda*) for assessment of in situ exposure to genotoxic compounds.	(Akcha, Hubert *et al.* 2003)
Genotoxicity of the Kishon River, Israel: the application of an in vitro cellular assay.	(Avishai, Rabinowitz *et al.* 2002)
In vitro application of the comet assay for aquatic genotoxicity: considering a primary culture versus a cell line.	(Kamer & Rinkevich 2002)
Toxic effects of wastewaters collected at upstream and downstream sites of a purification station in cultures of rainbow trout hepatocytes.	(Faverney, Devaux *et al.* 2001)
Application of the comet and micronucleus assays to butterfish (*Pholis gunnellus*) erythrocytes from the Firth of Forth, Scotland.	(Bombail, Aw *et al.* 2001)
Tail moment versus tail length--application of an in vitro version of the comet assay in biomonitoring for genotoxicity in native surface waters using primary hepatocytes and gill cells from zebrafish (*Danio rerio*).	(Schnurstein & Braunbeck 2001)

Detection of DNA strand breaks in brown trout (*Salmo trutta*) hepatocytes and blood cells using the single cell gel electrophoresis (comet) assay	(Mitchelmore & Chipman 1998)
Development and validation of the in vivo alkaline comet assay for detecting genomic damage in marine flatfish.	(Belpaeme, Cooreman *et al.* 1998)
Alkaline single cell gel (comet) assay and genotoxicity monitoring using bullheads and carp.	(Pandrangi, Petras *et al.* 1995)

Table S2. Number of articles selected in relation to the author's country of affiliation

Country	**Number of papers**
Argentina	3
Armenia	1
Australia	1
Austria	1
Bangladesh	1
Belguim	3
Brazil	32
Chile	1
China	8
Coreia	1
Croatia	6
Denmark	1
Egypt	3
France	16
Germany	13
India	17
Iran	2
Ireland	2
Israel	3
Italy	9
Japan	4
Korea	6
Mexico	3
Netherlands	2
Nigeria	3
New Zealand	1
Norway	4
Pakistan	4
Poland	1

Portugal	5
Saudi Arabia	2
Serbia	9
Slovenia	2
Spain	4
South Korea	1
Sri Lanka	1
Sweden	1
Thailand	1
Turkey	1
UK	4
USA	8

Table S3. Number of articles published in partnership with institutions from different countries

Countries	**Number of papers**
Bangladesh/ India/ Belgium	1
Belgium/ Portugal	1
Brazil/ Japan	1
Brazil/ Germany	1
Croatia/ Norway	1
Croatia/ France	1
Egypt/ Germany	2
France/ USA	1
Germany/ Serbia/ Austria/ China	1
USA/ Coreia	1
USA/ Poland	1
Iran/ Spain	1
Japão/ China	1
New Zealand/ Australia/ Germany	1
Nigeria/ India	3
Norway/ Denmark	1
Norway/ Germany/ France	1
Norway/ Spain/ France	1
Portugal/ Espanha	1
Portugal/ Reino Unido	1
Saudi Arabia/ Pakistan	2
Serbia/ Italy/ Spain	1
Slovenia/ Serbia	1
Sweden/ Germany/ China	1
Thailand/Japan	1

Table S4. Most cited selected articles, authors and year of publication.

Citation	Article	Authors	Year of publication
240	Alkaline single cell gel (comet) assay and genotoxicity monitoring using bullheads and carp.	Pandragi et al.	1995
199	Application of the comet and micronucleus assays to butterfish (*Pholis gunnellus*)erythrocytes from the Firth of Forth, Scotland.	Bombail et al.	2001
189	Development and validation of the in vivo alkaline comet assay for detecting genomic damage in marine flatfish.	Belpaeme et al.	1998
141	Potential value of the comet assay and DNA adduct measurement in dab (*Limanda limanda*) for assessment of in situ exposure to genotoxic compounds.	Akcha et al.	2003
132	DNA damage in eelpout (*Zoarces viviparus*) from Göteborg harbour.	Frenzilli et al.	2004
128	Genotoxicity of a polluted river system measured using the alkaline comet assay on fish and earthworm tissues.	Rajaguru et al.	2003
113	Genotoxicity assessment in aquatic environment impacted by the presence of heavy metals.	Barbosa et al.	2010
109	Fish as bioindicators to assess the effects of pollution in two southern Brazilian rivers using the Comet assay and micronucleus test.	De Andrade et al.	2004
107	Genotoxic and mutagenic effects of diesel oil water soluble fraction on a neotropical fish species.	Vanzella et al.	2007
106	Comet assay using mullet (*Mugil* sp.) and sea catfish (*Netuma* sp.) erythrocytes for the detection of genotoxic pollutants in aquatic environment.	De Andrade et al.	2004
102	Tail moment versus tail length--application of an in vitro version of the comet assay in biomonitoring for genotoxicity in native surface waters using primary hepatocytes and gill cells from zebrafish (*Danio rerio*).	Schnurstein et al.	2001

Table S5. Different species studied in the same paper.

Species	Author and year of publication
Catla catla *Cirrhinus mrigala* *Labeo rohita*	Hussain *et al.*, 2018
Limanda limanda *Platichthys flesus*	Burgeot *et al.*, 2017
Catla catla *Cirrhinus mrigala*	Hussain *et al.*, 2017
Abramis bjoerkna *Abramis sapa*	Aborgiba *et al.*, 2016
Salmo cenerinus *Salmo marmoratus*	Kračun-Kolarević *et al.*, 2016
Catla catla *Cirrhinus mrigala*	Hussain *et al.*, 2016
Limanda limanda *Melanogrammus aeglefinus*	Hylland *et al.*, 2016
Channa striatus *Heteropneustes fossilis*	Fatima et al., 2015 Fatima *et al.*, 2014
Zacco ornitorrinco *Pseudogobio esocinus*	Kang *et al.*, 2014
Clarias gariepinus *Oreochromis niloticusniloticus*	Osman *et al.*, 2012

Oreochromis niloticus *Cyprinus carpio*	Theepharaksapan *et al.*, 2011
Centropomus parallelus *Mugil cephalus* *Eugerres axillaris* *Oreochromis sp.* *Ariopsisfelis*	González-Mille *et al*., 2010
Dicentrarchus labrax *Liza aurata*	Nogueira *et al.*, 2010
Helicolenus dactylopterus *Conger conger*	Della Torre *et al*., 2010
Steindachnerina insculpita *Geophagus brasiliensis* *Cichla temensis* *Hoplias malabaricus* *Astyanax bimaculatus* *Oreochromis niloticus* *Cyprinus carpio*	Grisolia *et al*., 2009
Pleuronichthys cornutus *Conger myriaster*	Park *et al.*, 2009
Cyprinus carpio *Oncorhynchus mykiss*	Kim *et al.*, 2006
Mugil sp. *Netuma sp.*	De Andrade *et al*., 2004 De Andrade *et al*., 2004
Pleuronichthys verticalis	Roy *et al.*, 2003

Pleuronectes vetulus *Hippoglossina stomata*	
Ameiurus nebulosus *Cyprinus carpio*	Pandrangi *et al.*, 1995

Table S6. Species that were the most studied among selected papers on biomonitoring using comet assay in fish.

Species	Number of papers
Abramis bjoerkna	1
Abramis brama	1
Abramis sapa	1
Abramis sp	1
Aequidens tetramerus	1
Alburnus alburnus	2
Ameiurus nebulosus	3
Anguilla anguilla L.	1
Aphanius fasciatus	1
Ariopsis felis	1
Arius arius	1
Astyanax aff. paranae	2
Astyanax altiparanae	2
Astyanax bifasciatus	3
Astyanax jacuhiensis	1
Astyanax sp.	3
Barbus barbus	2
Botryllus schlosseri	1
Carassius auratus	5
Carassius carassius	1
Cathorops spixii	2
Catla catla	4
Centropomus parallelus	1
Channa punctatus	5
Channa striatus	2
Cichla temensis	1
Cirrhinus mrigala	3
Clarias batrachus	1

Clarias gariepinus	2
Cnesterodon decemmaculatus	1
Conger conger	1
Conger myriaster	1
Coris julis	2
Cryprinus carpio	12
Danio rerio	14
Dicentrarchus labrax	2
Eugerres axillaris	1
Gambusia holbrooki	1
Gasterosteus aculeatus	3
Geophagus brasiliensis	2
Helicolenus dactylopterus	1
Heteropneustes fossilis	3
Hippoglossina stomata	1
Hoplias malabaricus	2
Hyphessobrycon luetkenii	2
Hypostomus ancistroides	1
Labeo rohita	2
Lepomis macrochirus	1
Leuciscus cephalus	1
Limanda limanda	4
Liza aurata	2
Melanogrammus aeglefinus	1
Micropogonias furnieri	1
Mugil cephalus	1
Mugil sp	2
Netuma sp	2
Oncorhynchus mykiss	10
Oplegnathus fasciatus	2
Oreochromis niloticus	13
Oreochromis sp	1
Oryzias melastigma	1
Paralichthys olivaceus	1
Paralichthys orbignyanus	1
Periophthalmus waltoni	1
Petromyzon marinus	1
Pholis gunnellus	1
Phoxinus phoxinus	1
Platichthys flesus	2
Pleuronectes vetulus	1
Pleuronichthys cornutus	1
Pleuronichthys verticalis	1
Poecilia reticulata	1
Poecilia vivipara	1

Prochilodus lineatus	4
Pseudogobio esocinus	1
Salmo cenerinus	1
Salmo marmoratus	1
Salmo trutta	2
Scophthalmus maximus	4
Solea senegalensis	1
Solea solea	1
Squalius cephalus	3
Steindachnerina insculpita	1
Umbra pygmaea	2
Zacco ornitorrinco	2
Zoarces viviparus	1

Table S7. Genotoxic agents which were evaluated on selected papers and quantity of papers which evaluated the same genotoxic impurity.

Pollutants	**Number of papers**
Aflatoxin	1
Pesticides/ herbicides	10
Diclofenac	1
Aluminum	1
Chemical warfare agent dumpingas	1
Sediments	6
Hospital waste landfill	1
Atorvastatin	1
Benzocaine	1
Polychlorobiphenyls (PCBs)	2

Lead (Pb)	3
Cyclophosphamide	1
Cypermethrin	2
Sildenafilcitrate	1
Copper	1
Genotoxic compounds	1
Chemical contamination	1
Metal and organic contaminants	1
Chromium (VI)	1
Oil spill	5
Wastewater treatment plant	8
Nonylphenol ethoxylate (NPE)	1
Diesel water soluble fraction (DWSF)	1
Zoosporic fungi (Achlyaklebsiana e Aphanomyceslaevis	1
Verapamil	1
Gemfibrozil	1
Polycylic aromatic hydrocarbons (PAHs)	15
Thermal power plant effluent	1
Leachate	2
Mercury	1
Heavy metals	15
Methyl methanesulfonate (MMS)	4
Methylmercury	1

Microcystin	1
N-methyl-N'-nitro-N-nitrosoguanidine (MNNG)	1
Hydrogen peroxide (H_2O_2)	1
Furadan	1
Untreated industrial and municipal wastewaters.	2
Environmental pollution	38
Coal power plant pollution	1
Radiation	3
Xenobiotics	1
Uranium	1

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