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Identification of the bioactive compounds of skin mucus from asian swamp eel (*monopterus albus*) using liquid chromatography quadrupole-time-of-flight mass spectrometry (Article)

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Abstract

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Asian swamp eels have been widely accepted as sources of food, especially among various Asian cultures. However, their potential values as novel sources of therapeutic agents have not been widely appreciated. Like most other tropical fishes and amphibians, the outer integumentary system of *Monopterus albus* is covered with mucus layers, which may act as a mechanical and biochemical barrier for their skin. The biochemical components of these mucus layers may have certain compounds that may be medically beneficial to human. The current study was interested to screen the bioactive compounds of skin mucus from the tropical Asian swamp eel (*Monopterus albus*) using Liquid Chromatography Quadrupole-Time-Of-Flight Mass Spectrometry (LC-QTOF-MS), for this purpose, eel skin mucus extract was used for LC-QTOF-MS analysis. The screening results for the bioactive compounds revealed different bioactive compounds which possess multiple biological properties mainly anticancer, antimicrobial, anti-inflammatory and antioxidant activities. In conclusion, the current study illustrated that eel skin mucus contain different bioactive compounds which might be consider as therapeutic-promising agents. © 2019 Malaysian Society for Biochemistry and Molecular Biology. All rights reserved.

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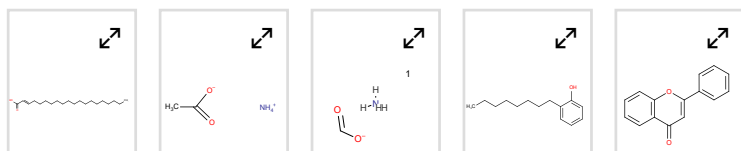
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- 1 Rossen, D.E., Greenwood, P.H.
A fourth neotropical species of Synbranchid eel and the phylogeny and systematics of Synbranchiform fishes (1976) *Bulletin of American Museum of Natural History*, 157, pp. 1-69. Cited 80 times.
- 2 Collins, T.M., Trexler, J.C., Nico, L.G., Rawlings, T.A.
Genetic diversity in a morphologically conservative invasive taxon: Multiple introductions of swamp eels to the southeastern United States
(2002) *Conservation Biology*, 16 (4), pp. 1024-1035. Cited 50 times.
doi: 10.1046/j.1523-1739.2002.01182.x
[View at Publisher](#)
- 3 Villarroel, F., Bastías, A., Casado, A., Amthauer, R., Concha, M.I.
Apolipoprotein A-I, an antimicrobial protein in *Oncorhynchus mykiss*: Evaluation of its expression in primary defence barriers and plasma levels in sick and healthy fish
(2007) *Fish and Shellfish Immunology*, 23 (1), pp. 197-209. Cited 86 times.
<http://www.elsevier.com/inca/publications/store/6/2/2/8/3/2/index.htm>
doi: 10.1016/j.fsi.2006.10.008
[View at Publisher](#)
- 4 Kronstrand, R., Brinkhagen, L., Birath-Karlsson, C., Roman, M., Josefsson, M.
LC-QTOF-MS as a superior strategy to immunoassay for the comprehensive analysis of synthetic cannabinoids in urine Forensic Toxicology
(2014) *Analytical and Bioanalytical Chemistry*, 406 (15), pp. 3599-3609. Cited 68 times.
link.springer.de/link/service/journals/00216/index.htm
doi: 10.1007/s00216-013-7574-x
[View at Publisher](#)
- 5 Kosjek, T., Heath, E.
Applications of mass spectrometry to identifying pharmaceutical transformation products in water treatment
(2008) *TrAC - Trends in Analytical Chemistry*, 27 (10), pp. 807-820. Cited 62 times.
doi: 10.1016/j.trac.2008.08.014
[View at Publisher](#)

- 6 Gómez, M.J., Gómez-Ramos, M.M., Malato, O., Mezcua, M., Fernández-Alba, A.R.
Rapid automated screening, identification and quantification of organic micro-contaminants and their main transformation products in wastewater and river waters using liquid chromatography-quadrupole-time-of-flight mass spectrometry with an accurate-mass database
(2010) *Journal of Chromatography A*, 1217 (45), pp. 7038-7054. Cited 122 times.
doi: 10.1016/j.chroma.2010.08.070
[View at Publisher](#)
-
- 7 González-Mariño, I., Quintana, J.B., Rodríguez, I., Cela, R.
Evaluation of the occurrence and biodegradation of parabens and halogenated by-products in wastewater by accurate-mass liquid chromatography-quadrupole-time-of-flight-mass spectrometry (LC-QTOF-MS)
(2011) *Water Research*, 45 (20), pp. 6770-6780. Cited 120 times.
www.elsevier.com/locate/watres
doi: 10.1016/j.watres.2011.10.027
[View at Publisher](#)
-
- 8 Broecker, S., Pragst, F., Bakdash, A., Herre, S., Tsokos, M.
Combined use of liquid chromatography-hybrid quadrupole time-of-flight mass spectrometry (LC-QTOF-MS) and high performance liquid chromatography with photodiode array detector (HPLC-DAD) in systematic toxicological analysis
(2011) *Forensic Science International*, 212 (1-3), pp. 215-226. Cited 38 times.
doi: 10.1016/j.forsciint.2011.06.014
[View at Publisher](#)
-
- 9 Lee, H.K., Ho, C.S., Lu, Y.P.H., Lai, P.S.J., Shek, C.C., Lo, Y.-C., Klinke, H.B., (...), Wood, M.
Development of a broad toxicological screening technique for urine using ultra-performance liquid chromatography and time-of-flight mass spectrometry
(2009) *Analytica Chimica Acta*, 649 (1), pp. 80-90. Cited 97 times.
doi: 10.1016/j.aca.2009.06.068
[View at Publisher](#)
-
- 10 Kaufmann, A., Butcher, P., Maden, K., Widmer, M.
Ultra-performance liquid chromatography coupled to time of flight mass spectrometry (UPLC-TOF): A novel tool for multiresidue screening of veterinary drugs in urine
(2007) *Analytica Chimica Acta*, 586 (1-2 SPEC. ISS.), pp. 13-21. Cited 124 times.
doi: 10.1016/j.aca.2006.10.026
[View at Publisher](#)
-
- 11 Decaestecker, T.N., Clauwaert, K.M., Van Bocxlaer, J.F., Lambert, W.E., Van Den Eeckhout, E.G., Van Peteghem, C.H., De Leenheer, A.P.
Evaluation of automated single mass spectrometry to tandem mass spectrometry function switching for comprehensive drug profiling analysis using a quadrupole time-of-flight mass spectrometer
(2000) *Rapid Communications in Mass Spectrometry*, 14 (19), pp. 1787-1792. Cited 71 times.
doi: 10.1002/1097-0231(20001015)14:19<1787::AID-RCM94>3.0.CO;2-S
[View at Publisher](#)
-

- 12 Decaestecker, T.U., Vande Casteele, S.R., Wallemacq, P.E., Van Peteghem, C.H., Defore, D.L., Van Bocxlaer, J.F.
Information-dependent acquisition-mediated LC-MS/MS screening procedure with semiquantitative potential
(2004) *Analytical Chemistry*, 76 (21), pp. 6365-6373. Cited 69 times.
doi: 10.1021/jac0492315
[View at Publisher](#)
-
- 13 Broecker, S., Herre, S., Wüst, B., Zweigenbaum, J., Pragst, F.
Development and practical application of a library of CID accurate mass spectra of more than 2,500 toxic compounds for systematic toxicological analysis by LC-QTOF-MS with data-dependent acquisition
(2011) *Analytical and Bioanalytical Chemistry*, 400 (1), pp. 101-117. Cited 148 times.
doi: 10.1007/s00216-010-4450-9
[View at Publisher](#)
-
- 14 Sadakane, Y., Konoha, K., Nagata, T., Kawahara, M.
Protective activity of the extracts from Japanese eel (*Anguilla japonica*) against zinc-induced neuronal cell death: Carnosine and an unknown substance
(2007) *Trace Nutr. Res*, 24, pp. 98-105. Cited 9 times.
-
- 15 Desai, S.D., Desai, D.G., Kaur, H.
Saponins and their biological activities
(2009) *Pharma Times*, 41 (3), pp. 13-16. Cited 18 times.
-
- 16 Miguel, M.G.
Anthocyanins: Antioxidant and/or anti-inflammatory activities
(2011) *Journal of Applied Pharmaceutical Science*, 1 (6), pp. 7-15. Cited 118 times.
http://www.japsonline.com/admin/php/uploads/117_pdf.pdf
-
- 17 Agoramorthy, G., Chandrasekaran, M., Venkatesalu, V., Hsu, M.J.
Antibacterial and antifungal activities of fatty acid methyl esters of the blind-your-eye mangrove from India ([Open Access](#))
(2007) *Brazilian Journal of Microbiology*, 38 (4), pp. 739-742. Cited 196 times.
<http://www.scielo.br/pdf/bjm/v38n4/a28v38n4.pdf>
doi: 10.1590/S1517-83822007000400028
[View at Publisher](#)
-
- 18 Njinga, N.S., Sule, M.I., Pateh, U.U., Hassan, H.S., Abdullahi, S.T., Ache, R.N.
Isolation and antimicrobial activity of [beta]-sitosterol-3-oglucoside from *Lanea kerstingii* Engl. & K. Krause (Anacardiaceae)
(2016) *Nitte University Journal of Health Science*, 6 (1), p. 4. Cited 3 times.
-
- 19 Tiwari, S.C., Husain, N.
Biological activities and role of flavonoids in human health-a
(2017) *Indian J. Sci. Res*, 12 (2), pp. 193-196. Cited 6 times.
-

- 20 Laws, S.C., Carey, S.A., Ferrell, J.M., Bodman, G.J., Cooper, R.L.
Estrogenic activity of octylphenol, nonylphenol, bisphenol A and methoxychlor in rats
(Open Access)

(2000) *Toxicological Sciences*, 54 (1), pp. 154-167. Cited 476 times.
doi: 10.1093/toxsci/54.1.154

View at Publisher
-
- 21 Tomowa, M.P., Panowa, D., Wulfson, N.S.
Steroidsaponine und steroidsapogenine
(1974) *Planta Medica*, 25, pp. 231-237. Cited 4 times.
03
-
- 22 Ukani, M.D., Nanavati, D.D., Mehta, N.K.
A review on the ayurvedic herb tribulus terrestris L
(1997) *Ancient Science of Life*, 17 (2), p. 144. Cited 10 times.
-
- 23 Hu, C.-Q., Chen, K., Shi, Q., Kilkuskie, R.E., Cheng, Y.-C., Lee, K.-H.
Anti-aids agents, 10. Acacetin-7-O-β-d-galactopyranoside, an anti-HIV principle from chrysanthemum morifolium and a structure-activity correlation with some related flavonoids

(1994) *Journal of Natural Products*, 57 (1), pp. 42-51. Cited 169 times.
doi: 10.1021/np50103a006

View at Publisher
-
- 24 Viana, P.A., De Rezende, S.T., Alves, A.D.A., Manfrini, R.M., Alves, R.J., Bemquerer, M.P., Santoro, M.M., (...), Guimarães, V.M.
Activity of *Debaryomyces hansenii* UFV-1 α-galactosidases against α-d-galactopyranoside derivatives

(2011) *Carbohydrate Research*, 346 (5), pp. 602-605. Cited 8 times.
doi: 10.1016/j.carres.2011.01.024

View at Publisher
-
- 25 Jung, Y.K., Ki, W.L., Haeng, J.H., Hyong, J.L.
Peonidin inhibits phorbol-ester-induced COX-2 expression and transformation in JB6 P⁺ cells by blocking phosphorylation of ERK-1 and -2

(2007) *Annals of the New York Academy of Sciences*, 1095, pp. 513-520. Cited 21 times.
<http://www.blackwellpublishing.com/0077-8923>
ISBN: 1573316954; 978-157331695-8
doi: 10.1196/annals.1397.055

View at Publisher
-
- 26 Pereira, D.M., Correia-da-Silva, G., Valentão, P., Teixeira, N., Andrade, P.B.
Anti-inflammatory effect of unsaturated fatty acids and ergosta-7,22-dien-3-ol from *Marthasterias glacialis*: Prevention of CHOP-mediated ER-stress and NF-κB activation (Open Access)

(2014) *PLoS ONE*, 9 (2), art. no. e88341. Cited 37 times.
<http://www.plosone.org/article/fetchObject.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0088341&representation=PDF>
doi: 10.1371/journal.pone.0088341

View at Publisher
-

- 27 Charles, A.K., Darbre, P.D.
Oestrogenic activity of benzyl salicylate, benzyl benzoate and butylphenylmethylpropional (Lilial) in MCF7 human breast cancer cells in vitro

(2009) *Journal of Applied Toxicology*, 29 (5), pp. 422-434. Cited 39 times.
<http://www3.interscience.wiley.com/cgi-bin/fulltext/122295520/PDFSTART>
doi: 10.1002/jat.1429

[View at Publisher](#)

- 28 Lee, J.-H., Lee, J.Y., Park, J.H., Jung, H.S., Kim, J.S., Kang, S.S., Kim, Y.S., (...), Han, Y.
Immunoregulatory activity by daucosterol, a β -sitosterol glycoside, induces protective Th1 immune response against disseminated Candidiasis in mice

(2007) *Vaccine*, 25 (19), pp. 3834-3840. Cited 84 times.
doi: 10.1016/j.vaccine.2007.01.108

[View at Publisher](#)

- 29 Bouic, P.J.D., Etsebeth, S., Liebenberg, R.W., Albrecht, C.F., Pegel, K., Van Jaarsveld, P.P.
Beta-sitosterol and beta-sitosterol glucoside stimulate human peripheral blood lymphocyte proliferation: Implications for their use as an immunomodulatory vitamin combination

(1996) *International Journal of Immunopharmacology*, 18 (12), pp. 693-700. Cited 181 times.
www.elsevier.com/locate/ijimmpharm
doi: 10.1016/S0192-0561(97)85551-8

[View at Publisher](#)

- 30 Hernández-Valle, E., Herrera-Ruiz, M., Salgado, G.R., Zamilpa, A., Ocampo, M.L.A., Aparicio, A.J., Tortoriello, J., (...), Jiménez-Ferrer, E.
Anti-inflammatory effect of 3-O-[(6'-O-palmitoyl)- β -D-glucopyranosyl sitosterol] from *Agave angustifolia* on ear edema in mice ([Open Access](#))

(2014) *Molecules*, 19 (10), pp. 15624-15637. Cited 15 times.
<http://www.mdpi.com/1420-3049/19/10/15624/pdf>
doi: 10.3390/molecules191015624

[View at Publisher](#)

- 31 Miyata, Y., Sato, T., Yano, M., Ito, A.
Activation of protein kinase C β II/E-c-Jun NH₂-terminal kinase pathway and inhibition of mitogen-activated protein/extracellular signal-regulated kinase 1/2 phosphorylation in antitumor invasive activity induced by the polymethoxy flavonoid, nobiletin

(2004) *Molecular Cancer Therapeutics*, 3 (7), pp. 839-847. Cited 60 times.

[View at Publisher](#)

- 32 Sautour, M., Mitaine-Offer, A.-C., Lacaille-Dubois, M.-A.
The *Dioscorea* genus: A review of bioactive steroid saponins

(2007) *Journal of Natural Medicines*, 61 (2), pp. 91-101. Cited 120 times.
doi: 10.1007/s11418-006-0126-3

[View at Publisher](#)

- 33 Dong, M., Feng, X.-Z., Wu, L.-J., Wang, B.-X., Ikejima, T.
Two new steroidal saponins from the rhizomes of *Dioscorea panthaica* and their cytotoxic activity

(2001) *Planta Medica*, 67 (9), pp. 853-857. Cited 42 times.
doi: 10.1055/s-2001-18856

[View at Publisher](#)

□ 34 Liu, X., Yang, Y., Zhang, X., Xu, S., He, S., Huang, W., Roberts, M.S.

Compound Astragalus and Salvia miltiorrhiza extract inhibits cell invasion by modulating transforming growth factor- β /Smad in HepG2 cell

(2010) *Journal of Gastroenterology and Hepatology (Australia)*, 25 (2), pp. 420-426. Cited 52 times.
<http://www3.interscience.wiley.com/journal/118533731/toc>
doi: 10.1111/j.1440-1746.2009.05981.x

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