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Analysis of Bioactive Substances from *Artemisia apiacea* and *Paulownia tomentosa*

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Phytochemical and biological analysis of 100 species or more natural products was investigated. Among them, two species *Artemisia apiacea* and *Paulownia tomentosa* were selected for further study.

The methanol extract of *A. apiacea* was showed hair-growth and anti-oxidant activities. Eight compounds such as 5-hydroxy-6,8-dimethoxycoumarin, 6,7-dimethoxycoumarin, 6-methoxy-7,8-methylenedioxcoumarin, 5,6-dimethoxy-7,8-methylenedioxcoumarin, 6-hydroxy-7,8-methylenedioxcoumarin, artemicapin C, apigenin, cacticin, and daucosterol were isolated from this plant. Among them, 5-hydroxy-6,8-dimethoxycoumarin (arteminin) was isolated for the first time from nature. Several modified compounds those with propyl, butyl, octyl and tolyl groups were found to have hypoglycemic effect on diabetic mice. Chrysin derivatives were synthesized by alkylation and condensation. Among them, chrysin 7-*O*-crotonate and chrysin 7-*O*-cyclopropanecarboxylate were showed hair-growth effects in black mouse (C57BL/6).

The methanol extract of *P. tomentosa* was showed antiviral and antibacterial activities. Six compounds such as methyl-5-hydroxy-[1,4]naphthoquino-[2,3-*b*]benzo-[1,2-*g*]benzofuran-6-carboxylate, paulowin, sesamin, daucosterol, methyl-5-hydroxy-dinaphtho-[1,2-2',3']furan-7,12-dione-6-carboxylate (MHDDC), and campneoside I were isolated from this plant. Among them, MHDDC was isolated for the first time from nature and showed antiviral activity against poliovirus types 1 and 3. Campneoside I was showed antibacterial activity against *Streptococcus* and *Staphylococcus* species.

In conclusion, MHDDC from *P. tomentosa* is offered as a promising lead compound for further study as a new drug for the treatment of infectious disease.