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Paradoxical effects of polyphenolic compounds from Clusiaceae on angiogenesis

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Titre	Paradoxical effects of polyphenolic compounds from Clusiaceae on angiogenesis
Type de publication	Article de revue
Auteur	Lavaud, Alexis [1], Soleti, Raffaella [2], Hay-de Bettignies, Anne-Emmanuelle [3], Richomme, Pascal [4], Guilet, David [5], Andriantsitohaina, Ramaroson [6]
Editeur	Elsevier
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Mots-clés	Angiogenesis [7], Clusiaceae [8], Endothelium [9], Nitric [10], Xanthone [11]
Résumé en anglais	Clusiaceae plants display high contents of xanthones and coumarins, the effects of which on endothelium, more particularly on angiogenesis, have not been assessed yet. We screened the capacity of six molecules from Clusiaceae – belonging to xanthones, coumarins and acid chromanes classes – to induce endothelium-dependent relaxation on mice aortic rings. Endothelial nitric oxide (NO) production was assessed in endothelial cell line using electron paramagnetic resonance technique. Then, the capacity of these molecules to induce capillary-like structures of endothelial cells was assessed. Cellular processes implicated in angiogenesis (adhesion, migration and proliferation) and Western blot analyses were then investigated. Among the tested molecules, isocalolongic acid (IA) and 2-deprenylrheediaxanthone (DRX) induced an endothelium-dependent relaxation of the aorta associated with an increase of NO production in endothelial cells. Using in vitro and ex vivo angiogenesis assays, it was shown that IA treatment promoted the formation of capillary-like network. In contrast, DRX prevented the ability of vascular endothelial growth factor (VEGF) to increase the formation of capillary-like network. IA increased endothelial cell proliferation while DRX decreased all cellular processes of angiogenesis. Western blot analysis showed that IA increased VEGF expression whereas DRX decreased ICAM-1 expression. Altogether, these data allowed identifying isolated molecules from Clusiaceae that exhibit a potential activity towards the modulation of endothelium-dependent relaxation involving NO release. Interestingly, they also highlighted paradoxical effects of the two compounds on cellular angiogenic processes, IA being pro-angiogenic and DRX anti-angiogenic.
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