



# Your browser is outdated

Update your browser to view ScienceDirect correctly.

[Check supported brow... ↗](#)

Your technical details and browser version:

**Request ID:** 9770bdc9398dbbe4-FRA

**IP:** 178.214.4.5

**UTC time:** 2025-08-30T02:08:37+00:00

**Browser:** Mozilla/5.0 (X11; Linux x86\_64) Miniature.io/6.0

AppleWebKit/537.36 (KHTML, like Gecko) QtWebEngine/5.12.4

Chrome/69.0.3497.128 Safari/537.36