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New Phosphonic Acids and Esters Derived from Indazole: Synthesis and Biological Activity Evaluation

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Bisphosphonates (BPs) are a group of compounds derived from bisphosphonic acid and their salts, with a P-C-P structure which confers higher metabolic and chemical stability. They are an important class of drugs with therapeutic applications in the treatment of diseases of bone mineral metabolism such as osteoporosis and Paget's disease. These compounds have also shown activity in other areas, such as antitumor and antiparasitic activities.¹ The use of these compounds in therapy is affected by their low oral bioavailability due to low lipophilicity and the presence of charges at physiological pH. The improvement of their pharmacokinetic properties can be obtained by the use of ester derivatives as prodrugs.²

In this work, we present the synthesis and characterization of various phosphonic acids and esters derivatives of indazole (**Figure 1**). The biological activity of these compounds were evaluated including their toxicity, antioxidant and antimicrobial activities.³ Bisphosphonic acid derivatives showed broad spectra with high activity against Gram – and Gram + pathogenic and commensal bacteria. These compounds also present antioxidant activity by the β -carotene/linoleic acid method.

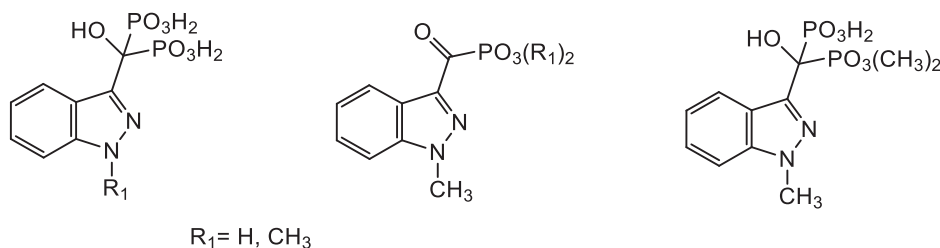


Figure 1: Structure of studied phosphonates derived from indazole.

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