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Review Article

A REVIEW ON PYRAZIN-2(1H)-ONE DERIVATIVES

POSSESSING BIOLOGICAL ACTIVITY

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ABSTRACT

Heterocyclic chemistry is one of the most complex and intriguing branch of organic chemistry and heterocyclic compounds constitute the largest and most varied family of organic compounds. Many broader aspects of heterocyclic chemistry are recognized as disciplines of general significance that impinge on almost all aspects of modern organic chemistry, medicinal chemistry and biochemistry. A Review on the application of pyrazin-2(1H)-one and related heterocyclic compounds have numerous prominent pharmalogicaleffects suchas antibacterial,antifungal,antimycobacterial anti-inflammatory analgesic,anticancer. A large number of pyrazine-2(1H)-one derivative have been found due to many scientistsfascinated because of the diverse biological activitiesby not only pyrazin-2(1H)-one buts its various substituted derivatives as well. This review was focused on the pyrazin-2-oneand its derivatives that are in development.

Keywords: Review, pyrazin-2(1H)-one, biological study.

INTRODUCTION

Pyrazin-2(1H)-one moiety is six membered heterocyclic compound having molecular formula C₄H₄N₂O.The synthesis and chemistry pyrazin-2(1H)-one have of attracted considerable attention in the past ten vears^{1,2}. Some of them exhibit biological activities including anti-viral³, anti-bacterial⁴, antiinflammatory⁵, antiprotozoal⁶, anti-HIV⁶, anticancer⁷ (colon cancer therapies) ⁸, anti-depressant⁹ and as kinase inhibitors^{10,11}. They are also used in the agricultural field as fungicides, herbicides and insecticides¹². Also, pyrazine-2(1H)-one moieties are present in the structure of various antibiotics such asechinomycin, levomycin and actinoleutin, which are known to inhibit the growth of gram positive bacteria and they are active against various transplantable tumors¹³. In addition, arylopyrazin-2-one derivatives have also found applications in dyes¹⁴, efficient materials^{15,16} electron luminescent organicsemiconductors¹⁷ chemically organicsemiconductors¹⁷, chemically controllable switches¹⁸, building blocks for the synthesis of anion receptors¹⁹, cavitands²⁰ and dehydroannulenes²¹.



Synthesis and biological importance of pyrazin-2(1h)-one and its derivatives (1). 3,5-Diaryl-pyrazin-2(1H)-one

pyrazin-2(1*H*)-ones as lead for the development of potent adenosine triphosphate (ATP) competitive protein kinase inhibitors with implications as anti-cancer drugs.²²



(2).3, 5-Dichloro-pyrazin-2(1H)-one

3,5-dichloro-pyrazine-2(1H)-one derivative used for fungicidal activity.against the human fungal pathogen Candida albicus.²³



(3). Substituted patterns of pyrazin-2(1H)one compounds

These compounds isolated from Microbes shows antibacterial activity

(A).phevalin(6-benzyl-3-isopropyl) pyrazin-2(1H)-one



(B). Tyrvalin(6-benzylalcohol-3-isopropyl) pyrazin-2(1H)-one



(C).Leuvalin(6-isobutyl-3-isopropyl) pyrazin-2(1H)-one



D). Argavalin



(E).Arglecin



(F).Maremycin E







(4). Hemacanthin B

It exhibit significant anti bacterial activity.24



(5). Pyrazin-2(1H)-one compound

3,6-diisobutyl Pyrazin-2(1H)-one compound and 3- isobutyl-6-(1-hydroxy-2- methylpropyl) Pyrazin-2(1H)-one these active compound found in marine inverbrates they are produce by fungi with significant bio activities.^{25,26} (A). 3,6,-diisobutyl compound

Pyrazin-2(1H)-one



(B). 3- isobutyl-6-(1-hydroxy-2methylpropyl) Pyrazin-2(1H)-one



(6).Sorazinone

It is isolated from sorangiuncellulosum which is known as producer of antibiotic thuggcin A. it show antibacterial activity.²⁷



ANTIMICROBIAL ACTIVITY

3,5-dichloro-pyrazine-2(1H)-one shows fungicidal activity. against the human fungal pathogen Candida albicus.

Phevalin (a), Tyrvalin(b), Leuvalin(c)^{28,29} its antibacterial activity Methicillin against staphylococcus

aureus.&Arglecin(e),Argvallin(d),^{30,31} against streptomycessp.Hemecanthin shows antibacterial activity against C.albicans.

3,6-diisobutyl Pyrazin-2(1H)one compound and 3- isobutyl-6-(1-hydroxy-2- methylpropyl) Pyrazin-2(1H)one shows antifungal activity against as Aspergillus sp.

Sorazinone show antibacterial activity against Norcardip sp.

CONCLUSION

The pyrazin-2(1H)-one based pharmaceuticals will be produced on a large scale by modern drug discovers company by different research development processes and will become available commercially for therapeutic use. pyrazin-2(1H)-one The and related compounds heterocvclic possess good activities that can be utilized for the development of new chemical entities to treat tuberculosis and various other conditions.

The reviewed pyrazin-2(1H)-one& related heterocyclic compounds has shown a wide spectrum of biological activities. The various substituted pyrazin-2(1H)-one & related heterocyclic compounds are having significant antimycobacterial, antibacterial, antifungal, antianginals, antidepressant, antipsychotic, antidiabetic,

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