SYNTHESIS AND CHARACTERIZATION OF NEW POLYCYCLIC NITROGEN HETEROCYCLE COMPOUNDS VIA MULTICOMPONENT REACTIONS FROM 3-ALKOXY-1*H*-PYRAZOLE-4-CARBALDEHYDES

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Multicomponent Reactions (MCRs) in which three or more starting materials react to form a product, where basically all or most of the atoms contribute to the newly formed derivative, are considered to be an important methodological arsenal in synthetic and medicinal chemistry [1]. These reactions have been strategically employed in various synthetic transformations comparing to classical methods that usually involve many steps with difficult procedures. MCRs exhibit advantages such as atom economy and waste prevention, because of the reduced number of work-up, extraction and purification procedures [2]. Therefore MCRs are often considered as useful alternative to sequential multistep synthesis.

Pyrazole containing compounds are considered pharmacologically important because of many biological activities such as antioxidant, antibacterial, anticancer, anti-inflammatory and more [3,4]. This heterocyclic moiety can be found in structures of many well-known drugs for different therapeutic treatments.

In order to explore synthesis of novel pyrazole-containing by MCRs, 3-substituted 1*H*-pyrazole-4-carbaldehyde was used as a starting material. A one-stage four-component reaction was optimized and successfully applied to obtain novel 6-amino-3-methyl-4-(1-phenyl-1*H*-pyrazol-4-yl)-2,4-dihydropyrano[2,3-*c*]pyrazole-5-carbonitrile which was further subjected to $AlCl_3$ catalyzed Friedländer reaction [5]. A series of novel polycyclic 2*H*-pyrazolo[4',3':5,6]pyrano[2,3-*b*]quinoline-5-amine derivatives were obtained in fair to good yields. Also a multicomponent Hantzsch pyridine synthesis was used for the synthesis of 1*H*-pyrazol-4-yl-2,6-dimethyl-1,4-dihidropyridine-3,5-dicarboxylates that were further oxidised to 1*H*-pyrazol-4-yl-2,6-dimethylpyridine-3,5-dicarboxylates. The structures of the synthesized compounds were confirmed by ^{1}H, ^{13}C and ^{15}N NMR spectroscopical investigation.

References

1. C. S. Graebin, F. V. Ribeiro. Curr. Org. Synth. **16** (2019) 855 - 899.
2. K.Hussain, D. Wadhwa. Int. J. Org. Chem. , **4** (2014) 174-181.
3. A. Ansari, A. Ali. New J. Chem., **41** (2017), 16.
4. M. J. Naim, O. Alam .et al J Pharm Bioallied Sci. **8** (2016) 2-17
5. M. Chioua, J. Perez-Peña. Med. Chem. **7** (2015) 845-855