

REVIEW OF LITERATURE

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The notions of closure system and closure operators are very useful tools in several areas of classical mathematics. The initiation of the study of closure spaces was done by Čech [24] in 1968 and studied by many authors Chvalina [38], Šlapal [63], etc., The generalized closed set was introduced by Levine [49] in 1970 as he considered sets whose closure belong to every open superset.

The spaces in which the concepts of g - closed sets and closed sets coincide are called $T_{1/2}$ -spaces. In 1977, Dunham [37] showed that $T_{1/2}$ -spaces are precisely the spaces in which singletons are open or closed.

In 1978, Warren [67] studied fuzzy continuous functions using closure of fuzzy sets, subbasis for fuzzy topology and fuzzy neighborhoods.

In 1983, Mashhour and Ghanim [5] have investigated many results can be extend the notions of a subspace, a sum and product of closure spaces. They examine the interaction between Č-proximities and Čech closure operators on a set X .

In 1985, Mashhour and Ghanim [52] introduced the notion of fuzzy closure spaces and analyzed their properties.

In 1991, Mukherjee and Sinha [53] defined fuzzy θ -closure operator, θ -closures of fuzzy sets in a fuzzy topological space and studied their properties using fuzzy δ -closures. Additionally these concepts were applied in some functions as well as some spaces which satisfy fuzzy separation axioms with respect to fuzzy θ -closures and δ -closures.

In 1991, Balachandran, Sundaram and Maki [2] introduced the notion of generalized continuous map (g- continuous map) using g- closed sets and analyzed some of their properties.

Intensive research in the field of generalized closed sets was done for the past 15 years as the theory was developed by Devi, Balachandran and Maki [35].

In 1997, Gnanambal [41] defined a new class of sets called generalized preregular closed sets and studied its properties. The notion of $T_{1/2}$ - spaces and generalized pre-regular continuous maps are analyzed.

In 1999, Julian Dontchev and Haruo Maki [45] discussed the class of θ - generalized closed sets, which was properly placed between the classes of generalized closed and θ -closed sets.

In 2000, Noiri and Rajesh [54] studied the concept of generalized closed sets in ideal bitopological spaces.

In 2003, Šlapal [63] defined some generalized topological structures called closure operations which are related with α -ary relations ($\alpha > 1$ an ordinal). These structures are applicable in digital topology.

In 2003, Yong Chan Kim [68] obtained the category L-FC as a topological category over set. Further subspaces and products of L-fuzzy closure spaces are discussed and initial structure of L-fuzzy closure spaces.

In 2006, Yueli Yue and Fu Guishi [69] have investigated the concepts of L-Fuzzy closure operator in L-Fuzzy topological spaces. They have introduced two kinds of L-Fuzzy closure operator from different points view

and proved that both L-TFCS – the category of topological L-Fuzzy closure spaces- and L-PTFCS- the category of topological pointwise L-Fuzzy closure spaces are isomorphic to L-FCTOP.

In 2008, Boonpok and Khampakdee [4] introduced ∂ - closed sets as generalization of closed sets, ∂ – closed sets, ∂ – continuous and ∂ – closed maps and their properties are analyzed.

In 2008, Chandrasekhara Rao, Gowri and Swaminathan [33] introduced the concepts of α -generalized semi closed (resp. open) sets in BiČech closure space and discussed some of their properties.

In 2008, Chandrasekhara Rao, Gowri and Swaminathan [32] introduced the notion of δ - open function for each Čech open set A of X and investigated δ - connectedness in Čech closure space.

In 2009, Boonpok [7, 19 and 8] discussed continuous maps in closure spaces, Ω -sets in closure spaces, closed maps in BiČech closure spaces

In 2009, Boonpok [9] introduced the concepts of C_0 - BiČech spaces and C_1 - BiČech spaces and studied some of their properties.

In 2009, Chandrasekhara Rao, Gowri ,Swaminathan and Stalin [33] introduced the concepts of generalized structural arrangements of various biomolecule such as carbohydrates, proteins etc are based on the rules of Čech closure operator and discussed the relationship between Čech closure space and structural configuration of proteins.

In 2009, Fathi H. Khedr and Hanan S. Al-Saadi [38] defined the notions of some operators as well as ij -generalized semi-closure, ij -semi-generalized closure, ij -generalized semi-interior and

ij-semi-generalized interior. Also the fundamental property of pairwise semi-generalized closed sets was considered and using the sets introduced the notion of pairwise semi $T_{1/2}$ -space. Further introduced the ij-semi-generalized continuous maps and ij-semi-generalized irresolute maps.

In 2010, Boonpok [20] described the concept of pairwise closed sets in biclosure spaces with their fundamental properties. Further studied the characterizations of pairwise closed maps using the pairwise closed sets.

In 2010, Boonpok [10] defined generalized biclosed sets in BiČech closure spaces and discussed some of their fundamental properties. The η -irresolute maps and their characterizations are studied using the generalized biclosed sets.

In 2010, Boonpok [18] has introduced the concept of $T_{1/2}^*$ -spaces and $T_{1/2}^{**}$ -spaces and studied their properties.

In 2010, Chawalit Boonpok [22] has introduced the concept of ∂ - Hausdorff biclosure spaces and investigated some of their characterizations.

In 2010, Chawalit Boonpok [6] studied the concepts of ∂ -closed sets in biclosure spaces and investigated the notions of bicontinuous maps , ∂ -closed maps in biclosure spaces and introduced some analyzed their characterizations.

In 2010, Devi and Parimala [36] have introduced the concepts of $\alpha\psi$ -closed (resp. $\alpha\psi$ -open) sets in BiČech closure space and some characterization and properties are investigated. The concepts of

${}_{\alpha\psi}C_0$ BiČech spaces and ${}_{\alpha\psi}C_1$ BiČech spaces are introduced and their basic properties are studied.

In 2011, Tapi and Navalakhe [66] described the concept of fuzzy biclosure spaces and studied some of properties.

In 2011, Santhiya, Saranya and Parvathi [56] introduced the concept of \mathcal{F} -closed sets in bi- \check{C} ech closure space and discussed its properties and characterizations.