

Bioactive Peptides: Emerging Tool To Fight Diseases

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ABSTRACT:

Bioactive peptides are chemical functional substances which are linked by covalent bond and are formed by amino acid residues. The essential requirement of food derived bioactive peptide increases day by day due its important property, for example high affinity, efficiency specificity which play vital role in human health by promoting digestive, endocrine, cardiovascular, immune system. They also known as future biological active regulators which help to reduce the chances of oxidation and microbial degradation in food stuff. The biological active substance having different considerable activities which includes antiproliferative, antioxidant, antimicrotubular, these activities are identified from the marine animal sources, specifically algae and cyanobacteria, which act as a secondary metabolite. Milk also contain rich amount of soluble and insoluble protein that is whey and casein protein. Alcalase potato protein hydrolysate (APPH) and germinated soya bean protein are bioceutical and play role in anti-obesity as well as anti-diabetes. The different presumed biological activities found in glutellin which carry at least 21 peptides with~53% of the nut storage protein. These activities are anti-hypertensives, antioxidants, immunomodulators, antimicrobial, anti-thrombotic, anti-cancer, hypocholesterolemic, anti-obesity and protease inhibitors that inhibits the cell cycle progression in cancer cells. These peptides have many advantages than the synthetic drugs. There is need to establish favourable condition to develop bioactive peptides for the human welfare in terms of treating many diseases as well as food beverages.

KEYWORDS: *Bioactive peptides, human health, cancer, novel adjuvent*

1. INTRODUCTION

Bioactive peptides may be defined as a specific protein segments which have good impact on health and help to improve body function. In 'Biopep' database 1500 different bioactive peptides have been mentioned (Singh et al., 2014). Bioactive peptides are chemical functional substances which are linked by covalent bond and these peptides are formed by amino acid residues with high molecular weight (Kitts and Weiler, 2003). The different activities are categorized according to the mode of action as antimicrobial, anticancer, antioxidant, mineral binding, antithrombotic, antihypertension, opioid and immunomodulatory (Shahidi and

Zhong, 2008; Sharma et al.; 2011.; walter and Sieber 2011). Proteins play essential as well as physio-chemical roles in health. During food processing and enzymatic protein degradation, the bioactive peptides are released. Due to its small size and specificity they have capability to stop the protein-protein interaction (Rizzello, C.G.; Tagliacruzchi, D.; et al 2016). The main components of bioactive peptides include plants, animal, fungi, microbes and its main product. The major focus on hydrolyzing protein is that to release small peptides in the hydrolysates. The bioinformatic approach focus on data available to find out the already identified bioactive peptides in a protein. For cleavage, enzymes are required to cleave the desire segment into smaller one (Abdel-Hamid, M.; Otte, J.; et al 2017. Babini, E.; Tagliacruzchi, D.; Martini, S.; et al 2017) which means particular enzyme required for particular substrate. This help to determine the known peptides from the unknown proteins. The recent advances in production of bioactive peptides from food including fat-dropping peptides, antimicrobial peptides, antidiabetics peptides, anticancer peptides and multifunctional peptides. The proteins are encrypted, sometime these peptides are released from precursor in which the activity of amino acids arrangement and sequence recognized. That part of proteins are formed by the regular interaction of specific amino acids sequences with in the body by natural processes. Bioactive peptides include residues length 2-20 amino acids with hydrophobic amino acids. Bioactive have ability to be resistant against the enzyme ingestion peptidases (Fields et al.; 2009). The bioactive compounds which are obtain from the marine sources have been noted as various bioactive properties which depend upon their mechanism of action for examples show activities against cancer, tumor, microtubules, hypertensive, proliferative, cytotoxic and as well as antibiotic properties (Wijesekara, I.; Kim, S. 2010). those compounds which are obtained from marine sources having many chemicals compounds that are phenolic, alkaloids, terpenoids, polyesters and other secondary metabolites. These metabolites are present in bacteria, seaweed, sponges and dinoflagellate (Jimeno, J.; Faircloth, G.; et al 2004). The secondary metabolite which includes invertebrates and bacteria form many medicinal product for examples anti inflammation, anticancer and antibiotics agents (Chakraborty, S.; Ghosh, U. 2010). The major sources of health maintaining components are food derived bioactive peptides. During the food processing, these peptides are released from the animals as well as plants proteins which includes soy, milk and fish proteins (Ryan, J.T.; Ross, R.P. et al 2011). In recent days the main interest is on marine bioactive peptides. Most of the bioactive peptides and depsiptides having anticancer properties these bioactive peptides isolated from marine animals for examples tunicates, corals, sea slugs, sponges and other marine species (Haefner, B. 2003; Naqash, S.Y.; Nazeer, R.A. 2010). Aplidine compound (Holzinger, A.; Meindl, U. Jasplakinolide 1997) is commercial available which is achieved by the clinical tests. For the regulation and enhancement of these peptides gives us many new therapeutic advancements which helps to improve and treat the severe diseases. According to the WHO report the severe problems are the main cause of millions death (WHO, 2017). From the present study the cereal derived food products are used to reduce the chances of cancer and other severe diseases (Chaturvedi et al., 2011). Some data suggests that the high content of cereals in food decrease the cancer progression rate especially breast, colon and prostate cancer (Jeong et al., 2003; Liu, 2007). Cereals are bioceuticals molecule which has specific effect and helps to improve the human health. Proteins and their peptides present in various quantities in the grain. Cancer is the major problem in all around world. Cell division may be defined as the cell split into daughter cell by meiosis and mitosis cell division. Apoptosis is a programmed cell death and stability between the apoptosis and proliferation which is maintained by the normal conditions. Due to variations in DNA leads to cancer by disrupting the functional

regulation processes. The term carcinogenic may be defined as the when normal cells converted into cancerous cells. It is identified by the increases in cellular as well as DNA levels that effect the cell to divide uncontrolled division that form a tumor which has ability to spread other body organs (Fearson, E.R.; Vogelstein, B.1990). Cardiovascular and diabetes are also the major cause of death worldwide. The major factor of heart failure, myocardial infarction and renal injury is hypertension (Takenaka T, et al 2014; Graska K, et al 2013)). Synthetic ACE (Angiotension-converting enzymes) including the lisinopril, captopril and enalapril show important role to reduce the blood pressure level. These inhibitor produced from different food proteins, i.e. zein, soybean, casein, ovalbumin etc. Bioceutical foods involves proteins, the protein hydrolyzates and peptides those which are obtained from hydrolyzed food protein and from other products (Yamamoto N, EjiriM, Mizuno S 2003). Those peptides which are obtain from the plant source like soybean show good antihypertensive, hypocholesterolemic, anti-obesity and anticancer activity (Singh BP, Vij S, Hati S. 2014) and soy peptides have been recommended to reduce the chances of cardiovascular disease.

Sources of bioactive peptide

There are many sources of bioactive peptides which are highly used in many fields including food industries, agriculture field etc.

- *Maize as a source of bioactive peptides.*

The cereals belong to the family Gramineae, which play essential role in food and also act as a important source because they contain carbohydrates, vitamin, proteins and minerals. Maize, rice, wheat are the essential crops which are present in human regular diet. The 1,000 million tons crop harvested in 2014 and maize is highly grown crop in worldwide (FAO, 1992). A maize grain designed an embryo, endosperm enclosed with starch grains and fiber. The important element present in maize is starch. Which is collected primarily of amylopectin and amylose. (72-73% of the total grains weight) accompanied by proteins which represent the 8-12% of the whole grain wt. (FAO, 1992).

- *Marine product as a source of bioactive peptides.*

The many bioactive peptides isolated from marine animals which includes mollusks, tunicates, sponges. The general sets of these peptides suggested in present studies. These studies include some compounds like papuamides (Mahammed, R.; Peng, J.N.: et al2006), stylisin which are derived from the sponges. For the actions enhancement of these compounds are first of all extracted, categorized, manufactured and additional changed for the progress of substitute (Shilabin, A.G.; Hamann, M.T. 2011; Adrio, J.; et al 2007; Simmons, T.;et al 2005). Nevertheless between the bioactive peptides and depsipeptides, many of them are thoroughly studied and also used in clinical trails. These compounds show many useful biologicaland also have ability to improve human health. The marine sources also helps to invent many more constitutional, serial as well as compositional activities. basically there are three methods for the production of marine bioactive peptides (Bhatnagra ,I.; Kim, S.; et al 2010).

- *Solvent isolation*

- *Enzymatic degradation*

- *Microbial fermentation*

Sponges

Globally 10,000 sponges have been explained happily many of them present in marine environment (Bergquist, R.M, 2001; Demosponge distribution Patterns. 1994). Basically bioactive peptides which has been found in 11 genera. Out of eleven genera three shows important activities against cancer as well as inflammation (Blunt, J.; Copp, B.; et al 2004).

From the sponges, many studied had been done on bioactive peptides, like cyclodepsipeptides which act as secondary metabolite with rare amino acids. Arenastatins A is a cyclodepsipeptides extracted from the *Dysidia Arenaria* which act as cytotoxic against KB cells (Aneriros, A.; Garateix, A.2004). Geodiamolide H extracted from a Brazilian sponge *Geodiacorticostylifera* which show antiproliferative activity against the breast cancer through the changing actin cytoskeleton (Freitas,V.; et al 2008). Homophymines, B-E, and A1-E1, extracted from the sponges *Homophymia* sp. show cytotoxic activity against human cancer cell lines (human prostate PC3, and ovarian OV3 carcinoma) (Andavan, G.; Lemmens-Gruber, R.2010, Zampellia, A.; et al 2008). Jaspamide is a cyclic desipeptides extracted from sponges of the genus *Jaspis* and *Hemiasrella*. Phakellistins extracted from oceans sponge *Phakelliacareri* stop leukemia cell development.

Tunicates and Ascidians

Ascidians showed bioactive peptides with innovative structure. Didemin is the compound which is extracted from the Caribbean tunicate *Trididemnum solidum* further contain from the other species having the similar genus (Schmitz, F.J.; et al 1993). Between these compound Didemin B showed both the properties such as antiproliferative as well as anti-tumor properties against prostatic cancer cell lines in human. the formation of DNA, RNA and protein is stopping by the Didemin B (Vera, M.D.; Joullie, M.M. 2002). Aplidine defined as the cyclodepsipeptide which is extracted from the tunicates. Aplidium albidum, which shows important activity i.e. is cancer against the many human cancer cells. which include lung, melanoma and breast cancers (Faivre, S.; et al 2005). These all type of cancer show compassion with small quantities of this compound. How the Aplidine worked and pathways; cell cycle arrest, stop the synthesis of protein and promote the programming cell death (Garcia – Fernandez, et al 2002).

Properties of aplidine

- It helps to stop the ornithine decarboxylase enzyme (which help to promote tumor formation and cell division).
- Another one, also inhibits the expression of vascular endothelial development factor gene (which show antiangiogenic effect).
- The most important property of aplidine is antitumor activity. Tamandarins A also used against the many cancer cell lines, which obtained from the marine ascidia and show cytotoxic desipeptides (Hamada, Y.; Shioiri, T. 2005, vervoot, H.; et al 2000).

Mollusks

It has broad spectra in the field of pharmacology. For the cancerous tumors, sea hare has ability to produce bioactive metabolite (Chakraborty,S.; Ghosh, U. 2010). Ziconotide is present in the marine mollusk *Conus magus* venom. Dolastatins is belong to the family of cytotoxic peptides which is extracted from the *Dolabella auricularia* in which dolastatin 10 and dolastatin 15 have shown the antiproliferative activity (Pettit, G.R.; et al 1995; Pettit, G.R.; Flahive, E.J. et al 1998).

Table 1.
 Marine animal sources of bioactive peptides with anticancer potential

Organism	Source	Compound	Bioactivity
<i>Dysidea Arenaria</i>	Sponge	Arenastatin A	Antitubulin
<i>Geodia</i> sp.	Sponge	Geodiamolide H	Antiproliferative
<i>Homophymia</i> sp.	Sponge	Homophymines	Antitumor
<i>Jaspis</i>	Sponge	Jaspamide	Antiproliferative

sp.hemiastrrella sp.			
Phakellia carteri	Sponge	Phakellistatins	Antiproliferative
Dolabella auricularia	Tunicate	Aurilide	Antitumor
Dolabella auricularia	Mollusk	Dolaststin	Antineoplastic
Didemnum sp.	Ascidians	Tamamdarins A and B	Antitumor

• *Marineprotein hydrolysates*

For production of peptides, which is contain from the food sources by using protein hydrolysis method which show many properties for example antimicrobial, antioxidants, antihypertensive and antiproliferative. To attain the sufficient control of the hydrolysates, there should be degradation of peptides bond which will divided into numbers of peptides or amino acids (Vioque, J.; et al 2001). At the high pH there are the destruction of some aminoacids. The generally used enzymatic method is protein hydrolysis instead of alkaline hydrolysis (Neklyudov,A.; et al 2000). To decrease the production of unwanted products from the enzymatic hydrolysis under favorable conditions i.e. temperature and pH. Numerous enzymes has been used to attain hydrolysate between the microbial as well as digestive protease involving pepsin, pancreatin, alcalase, trypsin, chymotrypsin and some others (Korhonen, H.; Pihlanto, A 2006).

• *Seaweed as a source of bioactive peptides;*

Most of the bioactive peptides have been obtained from the protein rich source that is soybean, bovine, egg, meat, sunflower, human milk, fish and gains. These peptides have ability to control the many diseases (Hartmann and Meisel 2017; Erdmann and others 2008; Lafarga and Hayes 2016) and also these peptides show the antidiabetic, antihypertensive and antioxidant properties.

Effects of bioactive peptides

Anticancer

In the earlier years, grains derived peptides have been shown the significant role to decrease The chances of the cancer by effecting the beginning, elevation and development. The crucial requirements for the current cancer inhibition therapy, the feasible anticancer approach has developed as chemoprevention. These Chemo-protective agents are predictable as a safe and low cost. The peptides attain these conditions, which are safer rather than the artificial one. They are existing in the consistent human food and have avarious series of convenience and suitability (Li et al., 2014). Recent studies suggest that, these peptides act as anticancer which promote programming cell death as well as angiogenesis. They play major role to stop the tumor metastasis, these molecules are certainly produced by agitation, enzymatic degradation, orgastrointestinal absorption (de Mejia and Dia, 2010). Bioactive peptides show the anti-tumor activity through the various processes; programming cell death initiation through the protein degradation (protease enzyme), in the presence of energy rich process (Burz et al., 2009). Which helps to reduce the chances of tumor resistance by the promotion of pro apoptotic receptors. The control of cell growth by the cell proliferation or synthetic pathways linked with the cellular mechanism (Kornienko et al., 2013). The antigenicity of cancer cells have ability to promote the immune function by giving the inflammation signs or symptoms that activate the immune cells to produce antibodies against it (Zitvogel et

al.,2013). The maize peptides have ability to enhance the various methods for various cancer cell lines. The anticancer activity of many peptides have been identified by using artificial models. The high apoptotic activity shown in HepG2 cell. These cells treated with maize peptides by the enzymatic degradation of protein which is extracted from the corn gluten meal (Li et al., 2013). In recent studies suggest that milk derived protein show anticancer activity. The bovine skim milk consumed which is isolated from the yeast *Saccharomyces cerevisiae* that stop the division of a human leukemia cell line (HL-60) (Legrand D, Pierce A, Ellass E, Carpentier M, Mariller C and Mazurier J: Lactoferrin structure and functions 2008). Lactoferrin is a glycoprotein with 80-kDa size, member of the transferrin and fish, tunicates, sponges etc. having many useful activities which includes antibacterial, immunomodulatory, anti-inflammatory, anticancer as well as anticancer activities.

Antioxidant activity

Antioxidant may be defined as the chemical substance which is present in very small quantity for long time. It helps to prevent the degradation of a substrate in the food stuffs. It plays essential role against many reactive oxygen species that may be has capacity to transfer various disease for example cancer. Reactive oxygen species have ability to trigger the lipid layer, DNA and protein simultaneously and ROS may take part in cancer progression. Those molecules which have more ROS degradation activity have capacity to control cancer rate as well as diabetes. In the beginning of the carcinogenesis, genetic changes for example variation and chromosomal rearrangement can be reduced by the degradation stress (Jumeri; Kim, S.M. 2011). These antioxidant peptides have been present in several food products i.e. milk (Kamau, S.M.; Lu, R-R. 2011), algae protein and protein hydrolysates (Kim, S.; Je.; Kim, S. 2007, Mendis, E.; Rajapakse, N.; et al 2005, Theodore, A.; et al 2008, Zhuang, Y.; et al 2009), casein. Out of these proteins several fish, soy, wheat, protein hydrolysates have identified as antioxidant activity and show scavenging ROS activity with the small number of ferric ions that convert Fe^{3+} into Fe^{2+} (Wu, H.; Chen, H.; et al 2003). Those bioactive peptides which are obtained from the aquatic showed the high ability of antioxidant property for the bioceutical as well as pharmaceutical as the alternative of chemically made antioxidants. Chemically made antioxidants are propylgallate, butylated hydroxyanisole (BHA), TBHQ (tert-butylhydroquinone and butylated hydroxytoluene (BHT). Maize peptides having antioxidant activity. This activity is determined by the amino acids such as tyrosine leucine, proline, phenylalanine and histidine. This activity depends upon the enzymatic process as well as pH. The native α zein show more activity than the α zein which is extract from the basic and acid conditions. Those peptides having weight smaller than 3kDa show high activity of antioxidant in HepG2 and Caco2 cells when treated against the high degradation stress. The activity of biological enzymes is improved by the maize peptides and protect against the biological spoilage through their antioxidant activity. besides, studied manage in macrophage models and show anti-inflammatory effects. Lipid degradation, protein oxidation and DNA damage also cause variation in the cell division and then leads to carcinogenesis. The maize peptides show beneficial effect on the cancer prevention. By using DPPH (α, α -diphenyl- β -picrylhydrazil) it has ability of scavenging activity of *Tinosporacordifolia* and protein. BMP-1 (maize basic peptide 1) that show antimicrobial activity (Duvick et al. 1992). Potato hydrolysate show antioxidant activity which helps to protect against the mucosal damage. Alcates degrade soy protein into the antioxidative hydrolysates. APPH (Alcates potato protein hydrolysate) reduce the liver fat accumulation, fibrosis and programming cell death. Additionally report suggest that the enzymatic

hydrolysis enhance the antioxidative activity of the subsequent hydrolysis through the rise in radical scavenging activity.

Antiproliferative activity

Didemnindepsipeptides show peptide and ester linkage and toxic to the cancer cell lines by affecting the protein formation in lab conditions. The protein formation stopped by the attachment of Didemnin to the complex of ribosome. Relationship between the both proteins formation and in human adenocarcinoma MCF-7 cells (Mayer, AM.; Gustafson, K.R. Marinepharmacology in 2000: Antitumorand cytotoxic compound. Int. J. Cancer 2003). Cryptophycin-52 belong to the marine depsipeptides. which is formed by the synthesis of chemicals with antitumor activity at small volume of cryptophycins compound helps to control the cell progression rate by managing the spindle microtubules, binding on site of tubulin and also activate the structural variations in the molecules of tubulin (Mayer,F.; Mueller,S., et al2005, Panda, D.; Ananthnarayan, V.; et al 2000). Most of the peptide and the amino acids derived from the plant sources having numerous protein which have been suggested as the antitumor or antiproliferative properties (Armstrong, W.; et al 2000, Kobayashi, H et al2004, Galvez, A.; et al 2001, Jeong, H.; et al 2007)). Cyclophosphamide act as an antitumor drug, which show potential against tumor progression as well as highly immunosuppression effects (Li, X., Jiao, L.L.; et al 2008)`. The antioxidant and anticancer effects can be characterized and separated from the precise peptides sequence. Recent studies suggested that those peptides having lower molecular weight greater flexibility and diffusivity rather than the high molecular weight. These peptides enhance the attraction with the component of the cancer cell and show anticancer activity (Jumeri; Kim, S.M. 2011).

Antihypertensives activity

The main cause of cardiovascular disease is hypertensive (Collins and others 2016). In this condition there is increase flow of blood in arteries (Kim and Wijesekara 2010; Fitzgerald and others 2014; Cheung and others 2015; Collins and others 2016) and it is globally affected up to 20% population (Ko and others 2011). ACE (angiotensive converting enzyme) and rennin both act as the key enzyme in RAS (renin- angiotensin system) endocrine system promotes the exterior blood pressure (Harnedy and FitzGerald 2013b; Cheung and others 2015). The regulation of blood pressure is carried out by the ACE which acts as multifunctional enzymes (Shi and others 2004; Collins and others 2016). Once the stream of blood enter into kidney which is low, then there is construction of renin which converts angiotensinogen into inactive form of angiotensinI that increase the flow of blood, angiotensin II by ACE. Angiotensin II play role in non-steroids, aldosterone from the adrenal cortex (Shi and others 2004; Torruco-Uco and others 2009; Harnedy and FitzGerald2013b; Cheung and others 2015). To control the hypertension by the inactivation of ACE which has ability to convert angiotensin I into angiotensinII subsequent in relaxation of blood vessel (Cheung and others 2015). Naturally protein derived product are taken as a harmless, minor and easily fascinated then the chemical synthesized drug. those peptides which has ACE property is extracted from the plant source of protein hydrolysates as well as animal sources (Otte and others 2007; Je and others 2009; Quist and others 2009; Liu and others 2010; Qu and others 2013b; Malomo and others 2015; Zhou and others 2015; Daud and others 2016). The marine organism is main area of research in the field of food industry because they providemany benefits for human health.many studies emphasis on the marine derived bioactivepeptides due to its high potential of ACE activity (Wijesekara and Kim 2010). From the papainhydrolysates of *Palmariapalmata* determine the 11 renin controlling bioactive peptides. The method of ACE peptides is identified yet, but invitro prevention method of peptides isdetermines by the Line Weaver-Burk plots (Shi and others 2004;He and others 2013). Competitive as well as

noncompetitive inhibition also determined in ACE. Maizepeptides are highly used as antihypertensive property. These peptides contain from the Ala-Tyr sequence from corn gluten meal, which act as a major side product of corn oil, corn starch and fiber highly showed prevention against the angiotensin I converting enzyme (Yang et al., 2007; Lin et al., 2011). Some studies suggest that, those peptides having smaller size than 3kDa show high efficiency to control the blood pressure level at the amount of 100mg/in avoluntarily hypertensive model of rat (Huang et al., 2011). From this studies it results the molecular weight highly effecting the hypertensive activity. The resulting peptides treated with the ultrasonic to corn gluten protein before the hydrolysis enhance the hypertensive property (Zhou et al., 2013). By using HPLC techniques antihypertensive peptides had been extracted and analysis as Leucine-glutamine-proline(LGP) and Leucine-serine-proline (LSP) (Puchalska et al., 2013).

Antidiabetic activity

Diabetes mellitus one of the major health issue all around the world 336 million individual suffering every year and it is expected that it will reach to 552 million people in the year 2030. DM is the major cause of death globally because it harms the human health, society and increase the burden of money (Anguizola and other 2013; RSC Adv. 2015). DM caused by the less production of insulin in pancreas or insulin resistance which results in abnormal blood glucose level. It is also related with many more disease for examples cardiovascular disease. (Barde and other 2015). Diabetes mellitus are categorized as insulin dependent (type 1) and insulin independent (type 2) are the widespread form of disease. Type 1 diabetes, about 5% to 10% started due to the abnormality in pancreas to generate insulin. This failure done by the beta cell demonstration (Anguizola and others 2013; Kim and others 2014; Chiara and Adrianna 2016). The reason for the augmentation of occurrence and severity are overweight, aging, sedentary life and family background. There are more need to give attention type 2 rather than type 1 because it is curable disease. In the case of type 1 diabetes injection of insulin is must to maintain standard life, however there are very less cases for the requirement of insulin injection in type 2 diabetes. When the enzymes of carbohydrates hydrolyzing and following digestion by small intestine are react then there is a breakdown of dietary carbohydrates which is consider as the main source of blood glucose. There by suppression of enzymes like α -amylase and α -glucosidase highly used in many therapies, in the case of type 2 diabetes (Kim and others 2008; xindi and others 2016). while DPP-IV is not proved but many studies show alternative designed which is prepared from the previous knowledge of lock and key models (enzyme substrate) the dipeptides acts as competitive inhibition mechanism which has small in size as well as moral oral availability (Stockel-Maschek and other 2003; Deacon and Holst 2006). From the seaweed ACE, food oxidation inhibitory peptides as well as protein hydrolysates can be obtained.

Various beneficial effects of bioactive compounds derived from beetroot and their use in food industry, have been critically reviewed by Chhikara et al. (2019). Comprehensive researches are going on in the exploration of bioactive compounds and unravelling their usefulness for human health (Bihana et al. 2018; Chhikara et al. 2018a and b; Kumar et al. 2019; Meheta et al. 2016; Mishra et al. 2017; Pandey et al. 2016; Sharma et al. 2019; and Sharma et al. 2016).

Future prospects of bioactive peptides

Food derived bioactive peptides have been used for many biological activities and having good impact on human health. The biological activities of these peptides have been used in many ways like biotechnologist, neurologists, pharmacologist as well as food technologists. All these peptides which are mentioned in above, these highly used to cure many diseases include cancer, diabetes, heart disease and others. Those peptides which are obtained from marine source showing many activities for examples anticancer, antioxidative and

antiproliferative activities. Still the essential requirement for future prospect is that to explain the chemical structure of bioactive peptide, method of exploit and how these peptides related with the cancer cells. The antioxidant activity is determined as the essential parameter for measuring the nourishing and beneficial potential of plants.

2. CONCLUSION

This review basically focused on the ROS produced through the metabolic processes are measured as the important source for oxidation stress in living organism. Many suggestions prove that the maize and marine peptides act as a therapeutic-agents against many diseases like cancer. The artificial models will be useful to determine the anticancer as well as antihypertensive activity of maize peptides. Seaweed derived peptides has ability to prevent against the cardiovascular and diabetes diseases. The main problems are that the well organized consumption of the bioactive peptides due to high mark of complexity and severity of the algal cell polysaccharide should be explained. Studies suggest that the peptide attained from the protein hydrolysates has hown antioxidant, antiproliferative and antitumor activities. Still the need of research is necessary on the mode of action on the cell cycle orprogramming cell death. Many marine peptides exposed to clinical trial which act as secondary metabolites from animals but the existence is unknown in marine protein hydrolysates.

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