

(Provisional translation)

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- Prevent decay. And biodegradation
- Packaging materials manufacturer developed the world's first hybrid functions
- Can be stored for a long time, Japan Agricultural Cooperatives are under examination

More Devices Co.,LTD., a packaging materials manufacturer, has developed the world's first material that combines freshness-keeping and biodegradation functions. It can be processed to packaging bags, cushioning materials, etc. and used for fruits and vegetables to prevent decay. It started to be used in 2019 as Edamame (green soybean) packaging bags in Odate City, Akita Prefecture, and is also tested by agricultural cooperatives in Yamagata, Nagano, Yamanashi and Kumamoto Prefectures. According to the company, it is also confirmed to be effective for flowers, meat and fish.

Technology that does not increase the number of mold and bacteria, which decay fruits and vegetables, is used for freshness-keeping, on the other hand, technology that increases the number of microorganisms is used for biodegradation. Up until now, it has been difficult to balance both functions. The company successfully incorporated different additives involved in the control and increase of microorganisms into its materials and added both functions. Products are marketed under the brand name "Apinonn Keeper".

Ethylene gas generated from fruits and vegetables is discharged out of the bag, and ethylene gas remaining in the bag is decomposed into carbon dioxide and water by touching components in the bag film.

It is a mechanism to keep fruits and vegetables fresh by suppressing breathing and increasing humidity. Antibacterial agents are included in the material to reduce mold development.

Unlike conventional freshness-keeping materials, it is effective without sealing. Products such as film, cushioning, and fruit caps etc. are developed. It can reduce the loss at sales site and on transportation, and it can store products for a long time and ship it during off-season period.

In the test, lettuce was wrapped in film and preserved at room temperature for nine days. Although lettuce unpackaged and one packaged with conventional plastic bag both decayed, lettuce using the company's product did not decay. It prevents decay, kept at room temperature, 7 days for strawberries, 5 days for bananas, and 10 days for mangoes.

As for biodegradation technology, it has introduced oxidative biodegradation with which the amount of additives contained in the material can be changed and the period until the bag is decomposed can be adjusted. Plastic molecules collapse in natural environment with such as sunlight and heat.

Most domestic biodegradable materials are hydrolysis type, and it was difficult to have them in stock because they were decomposed within a certain period of time after production. Oxidative type enables processing into hard products and possession of inventory.

日本農業新聞

腐敗防ぎ
生分解性包装資材メーカー 世界初の両立
長期保存可 JAも試験

包装資材を手掛けるモアディバイスは、鮮度保持と生分解性の二つの機能を併せ持つ資材を、世界で初めて開発した。包装袋や梱包（こんぼう）緩衝材などに加工し、青果物に使うと腐敗を防げる。2019年から秋田県大館市のエタマメの包装袋で利用を始め、山形、長野、山梨、熊本県などのJAでも試験する。同社によると、花や肉、魚でも効果を確かめているという。

鮮度保持には青果物を腐敗させる微生物を増やさない技術を、生分解性では逆に分解を早めるために微生物を増やす技術を使う。これまで機能の両立は難しかった。同社は、微生物の抑制・増加に関わる異なる添加物を素材に独自配合し、両方の機能を持たせることに成功した。「アピノンキーパー」のシリーズ名で製品展開する。

青果物から発生したエチレンガスは袋外に排出され、袋内に残ったエチ

レンガスは袋の中の成分に触れることで二酸化炭素（CO₂）と水に分解される。青果物の呼吸を抑え、湿度を高めて鮮度を保つ仕組みだ。素材に抗菌剤を含み、カビの発生も軽減する。

従来の鮮度保持資材と異なり、密閉しなくても効果を発揮する。フィルムや緩衝材、フルーツキヤップなどの製品を展開する。売り場や輸送中のロスを減らせる他、長期保存して端境期に出荷することも可能だ。

試験ではレタスをフィルムで包んで、常温で9日間保存した。無包装や市販のポリ袋では腐敗したが、同社の製品では腐敗しなかった。イチゴで7日間、バナナで5日間、マンゴーで10日間、常温保存で腐敗を防げた。

生分解の技術には、資材に含まれる添加物の量を変えて、袋が分解されるまでの期間を自在に調整できる「酸化型」を採用した。太陽光や熱などの自然環境でプラスチック分子が崩壊する。

国内の生分解性資材は水によって分解する「加水分解型」がほとんどで、製造後一定期間で分解してしまうため在庫を持つことが難しかった。酸化型は、硬い製品への加工や在庫の所有が可能になる。